

MARTIN BEHAIM

HIS LIFE AND HIS GLOBE

PUBLISHERS' NOTE

*Only Five Hundred and Ten
Copies of this work have been printed, of
which this Copy is Number Seventy three*



MARTIN BEHAIM.

From a Portrait in the possession of the family.

MARTIN BEHAIM

HIS LIFE AND HIS GLOBE

BY

E. G. RAVENSTEIN, F.R.G.S.

First Victoria Gold Medallist of the Royal Geographical Society

WITH A FACSIMILE OF THE GLOBE PRINTED IN COLOURS
ELEVEN MAPS AND SEVENTEEN ILLUSTRATIONS

LONDON

GEORGE PHILIP & SON, LTD., 32, FLEET STREET

LIVERPOOL: PHILIP, SON & NEPHEW, LTD., 45-51, SOUTH CASTLE STREET

1908

[All rights reserved]

ALBERTA BETA

THE NEW YORK PUBLIC LIBRARY

ASTOR LENOX TILDEN FOUNDATION

1215 6TH AVENUE NEW YORK 17, N.Y.

ALBERTA BETA

THE NEW YORK PUBLIC LIBRARY

ASTOR LENOX TILDEN FOUNDATION

1215 6TH AVENUE NEW YORK 17, N.Y.

ALBERTA BETA

THE NEW YORK PUBLIC LIBRARY

ASTOR LENOX TILDEN FOUNDATION

1215 6TH AVENUE NEW YORK 17, N.Y.

ALBERTA BETA

THE NEW YORK PUBLIC LIBRARY

ASTOR LENOX TILDEN FOUNDATION

1215 6TH AVENUE NEW YORK 17, N.Y.

CONTENTS

	PAGE
INTRODUCTION	1
THE LIFE.	
I. OLD NUREMBERG	5
II. THE BEHAIMS OF SCHWARZBACH	5
III. EARLY YEARS, 1459-1476	7
IV. IN THE NETHERLANDS, 1476-1484	8
Martin Behaim at Mechlin, Martin Behaim at Antwerp, 8; A Supposed Visit to Lisbon, 1481 or 1483, A Dance at a Jew's Wedding, Departure from Antwerp, 1484, 9.	
V. BEHAIM IN PORTUGAL	10
Germans at Lisbon, 10; German Brotherhoods, Martin Behaim's Private Life, 11.	
VI. THE JUNTA DOS MATHEMATICOS	12
João de Barros and the 'Junta,' 12; The Astronomical Expedition of José Vizinho, 1485, Behaim as an Astronomer, 13; The Astrolabe, 15; The Meteoroscope, The Cross-Staff, 16; The Quadrant, The Nocturnal, Sundials, 17; The Ephemerides, 18.	
VII. BEHAIM'S AFRICAN VOYAGE, 1484-1485	20
Portuguese Voyages of Discovery, 1472-82, 20; Diogo Cão's First Voyage, 1482-84, Diogo Cão's Second Voyage, 1485-86, 21; The Voyage of Bartholomeu Dias, 1487-88, 22; Minor Expeditions, João d'Aveiro and Benin, 1484-85, 23. Behaim's Own Accounts of his Voyage: The Story as told on the Globe, The Story as told in the 'Liber chronicorum,' 24; A Summary of the two Accounts, Behaim's Account Examined, Grains of Paradise, Pepper and Cinnamon, 25. The Globe and Contemporary Maps, 26; Lower Guinea, The Southern Extremity of Africa, Upper Guinea, 27; The Guinea Islands, Insula Martini—Anno bom, 28. Conclusion, 29.	
VIII. BEHAIM'S KNIGHTHOOD, 1485	30
IX. BEHAIM AND COLUMBUS	32
X. BEHAIM AND MAGELLAN	34
XI. BEHAIM AND THE DISCOVERY OF AMERICA	39
XII. A VISIT TO NUREMBERG, 1490-1493	41
Object of the Visit, Business Transactions, 41; Behaim's Globe, 42; Martin Behaim's Family Relations, 42.	
XIII. A MISSION TO FLANDERS, 1493	43
Flanders in 1493, Perkin Warbeck, 43; Behaim's Account of his Mission, D. Jorge, the son of King John II., 44; Maximilian, the King of the Romans, and his son Philip, Conclusion, 45.	

	PAGE
XIV. FAYAL AND THE AZORES	46
The discovery of the Azores, Nomenclature of the Azores, 46; The Colonization of the Azores, 47; The Hurters of Flanders, Joz d'Utra (Josse van Hurter) as Capitão donatorio, 48; The Privileges of a "Captain donatory" or Governor, The Peopling of Fayal, Joz d'Utra and his descendants, 49; Martin Behaim in Fayal and his family, A projected Voyage of Discovery, 1486, Martin Behaim's Prophecies, 50.	
XV. THE DEATH OF BEHAIM	51
Wolf Behaim's Death at Lisbon, The Death of Martin Behaim, 51; Memorials at Nuremberg, The Monument of Behaim, 52.	
XVI. MARTIN BEHAIM THE YOUNGER, 1489-1520	58
Young Martin charged with Manslaughter, 53; A proposed Visit to Nuremberg, Young Martin at Nuremberg, 54; Law Proceedings, Sent to a Schoolmaster, 55; Return to Portugal, 56.	
THE GLOBE.	
XVII. THE HISTORY OF THE GLOBE	57
Contemporary Globes, 57; George Holzschuher's Suggestion, Behaim's Qualifications, The Manufacture of the Globe, 58; Repairs of the Globe, A General Description, 59.	
XVIII. FACSIMILES OF BEHAIM'S GLOBE	60
Facsimiles in Solido, 60; Pseudo-Facsimiles in Plano, 61; My own "Facsimile," 62.	
XIX. THE SOURCES OF BEHAIM'S GLOBE	62
Ptolemy, Isidor of Seville, 62; Marco Polo, 63; His route plotted and result with reference to the supposed extent of the habitable world, 64; Sir John Mandeville, Portolano Charts, 65; Toscanelli, Portuguese Sources, 66; The islands of the Atlantic as delineated by Behaim and by Portuguese Pilots, A Map of Western Africa from Materials available in 1492, 68; Miscellaneous Sources, Sources not traced, 69; Conclusion, 70.	
XX. NOMENCLATURE OF THE GLOBE AND COMMENTARY	71
How the Town Council of Nürnberg ordered the Globe to be Made, The Authorities consulted, The Story of Behaim's Voyage, 71; Equator, Parallels and Ecliptic, The Meridian, 72; The Artificial Horizon, 73.	
The Ocean, 73.	
The Islands of the Atlantic, Iceland, British Isles, 74; Insula de Brazil, The Azores, 75; Madeira, Canary Islands, Cape Verde Islands, 76; Antilia, St. Brandan's Island, 77.	
Continental Europe, Scandinavia, 77; North-Eastern Europe, Hungary and the Lower Danube, Germany, 78; France, Portugal, Castile and Aragon, Italy, 79; The Balkan Peninsula, Little Tartary, 80.	
Asia: Asia Minor, Armenia, Syria, 81; Babylonia, Arabia, Persia, 82; India Intra Gangem, 83; India Extra Gangem, The Country of the Sinae, India, 84; Further India, 85; The Indian Ocean and its Islands, Taprobana, Ceylon, 86; Java Minor, Java Major, Pentan, 87; Nekuran, Angaman, Islands of the Satyrs, Candyn, The Magnetic Island, 88; Silver, Gold and Pearl Islands, Cipangu, The Indian Spice Trade, 89.	
Inner Asia: Western Turkistan, Tarim (Eastern Turkistan), 90; Tartary, 91; Cathai, Mangi, 92. Ophir and Havilah, St. Thomas, 94; Appolonius of Tyre, The Three Holy Kings and Prester John, 95; The Romance of Alexander, 96.	
Africa: Ptolemaic Nomenclature, 96; Egypt, 97; Barca and Tripoli, Tunis, Buja, Oran and Tlemsen, Fez and Morocco, The West Coast of the Sahara, 98; Senegambia, Upper Guinea, 99; Benin, The Guinea Islands, 100; Inner Guinea, 101; The Sahara, Abyssinia and Nubia, Lower Guinea, 102; River Congo to the Cape, Behaim's "Furthest," 103; Inner Tropical South Africa, Zanzibar, 104; Madagascar, Scotra, 105.	

APPENDIX	PAGE 107-116
--------------------	-----------------

LETTERS OF MARTIN BEHAIM TO HIS UNCLE LEONHARD.

- I. Mechlin, April 17, 1477, 107.
- II. Mechlin, October 13, 1477 (with Facsimile), 107.
- III. Frankfurt, September 17, 1472, 108.
- IV. Antwerp, June 8, 1479, 109.
- V. Legal Documents referring to a Dance at a Jew's Wedding, 1483, 110.
- VI. Legal Documents concerning Bonds signed by Behaim at Antwerp, May 4, 1484, 110.
- VII. Statement of Expenses incurred in the Manufacture of the Globe, 1492, 111.
- VIII. Dr. H. Schedel's Remarks on the Globe, 112.
- IX. Letter of Dr. H. Monetarius to King John of Portugal, July 14, 1493, 113.
- X. Martin Behaim to his Cousin Michael, March 11, 1494, 113.
- XI. Valentin Ferdinand's Account of Fayal and Pico, 114.
- XII. Two Letters addressed by the Town Council of Nuremberg to King Manuel of Portugal, June 7, 1518, and May 12, 1521, 115.
- XIII. Letter of Albrecht Dürer to Michael Behaim, 116.

INDEX	117
-----------------	-----

ILLUSTRATIONS

Plate	1. Portrait of Martin Behaim. (<i>From a painting in the possession of the family</i>).	Frontispiece
"	2. The arms of Behaim. (<i>From a block engraved by Albrecht Dürer in the possession of Freiherr von Behaim</i>)	5
"	3. The house in which Behaim was born. (<i>From a photograph by F. Schmidt</i>)	7
"	4. Behaim's monument at Nuremberg. (<i>From a photograph by the same</i>)	52
"	5. The Globe at Nuremberg in 1904. (<i>From a photograph taken by the kind permission of Freiherr von Behaim in 1905</i>)	57
"	6. Facsimile of a letter written by Martin Behaim, dated Mechlin, October 13th, 1477, now in the family archives at Nuremberg	107
In Text.	7. The Arms of Portugal in 1484 and 1485	21
"	8. The Padrão of Cape Cross, 1485	22
"	9. Rock inscriptions on the Lower Congo relating to Cão's voyage of 1485-1486	22
"	10-17. Illustrations of astronomical instruments (astrolabes, quadrant, cross-staff, back-staff, sundials, etc.)	15-18

COLOURED MAPS

(At end of Volume.)

	PAGE
1. The World as known to Christian Europe in 1492	to follow 116
2. The Sources of Behaim's Globe, with six insets	"
<small>Insets (1) and (2) : Scandinavia and Head streams of the Nile, from the Ulm edition of Ptolemy, 1482 ; (3) Antilia according to Gracioso Benincasa, 1488 ; (4) Cipangu according to Behaim, 1492 ; (5) and (6) Eastern Asia and Central Africa, according to Waldseemüller, 1507.</small>	
3. The Route of Marco Polo, plotted from his narrative	"
<small>Inset: The travels of Marco Polo, according to the map in the Sala dello Scudo, Venice.</small>	
4. The Islands of the Atlantic (Azores, Canaries, Cape Verde, and Guinea Islands) according to Soligo or A. Benincasa, Behaim, and modern maps	"
5. Guinea and South-Western Africa, compiled from materials available in 1492	"
<small>Insets : Eight maps of Martin's island, Diogo Cão, or Annobom.</small>	

FACSIMILE OF BEHAIM'S GLOBE

On the scale of the Original. In 4 sheets, size 30 × 24 inches, folded in pocket inside end cover.
(Printed in colours by W. Griggs.)

Index-Map showing the arrangement of the sheets, page 128.

MAPS IN TEXT

Catalan Map of the World, 1375	65
The World according to Fra Mauro, 1457	67
The World according to Henricus Martellus Germanus, 1489	67
The Laon Globe, 14—	57
Ten Maplets illustrating the Discovery of South America, 1500-1517	36
The Mediterranean : Ptolemy amended	66

MARTIN BEHAIM.

HIS LIFE AND HIS GLOBE.

INTRODUCTION.

MARTIN BEHAIM has been credited with having greatly advanced the art of navigation and with having made extensive voyages of discovery under the Flag of Portugal, but is best known as the author of a remarkable globe, which was making at Nuremberg whilst Columbus was crossing the western ocean in search of the riches of the East. The story of his life and life's work should consequently prove of great interest to students of the history of geography.

The materials for doing full justice to this subject are, unfortunately, very fragmentary, and there is little hope that the future will lead to the discovery of documents likely to shed additional light upon this matter. The legends upon the globe, supplemented by a short account in Hartmann Schedel's '*Liber Chronicorum*,'¹ give us Behaim's own version of a voyage along the west coast of Africa, when he claims to have commanded a Royal vessel; but diligent searches in the archives of his family and of his native town have failed to bring to light information on a subject which interests us equally much, namely, his claim to be numbered among the great mathematicians and cosmographers of his age.

My own inquiries at Nuremberg have enabled me to supplement to a slight extent the information already gathered by Ghillany and Dr. Günther, but neither the "archive" of the Behaim family, nor the search kindly undertaken by Lieutenant Hans von Imhof among old family letters still preserved by him, yielded anything

calculated to throw light upon Behaim's doings whilst in Portugal. Baron Holzschuher referred me for information to Gatterer's '*Historia Genealogica Dominorum Holzschuerorum*' (Norimb., 1775),² but although that valuable work contains some details about George Holzschuher, who helped Behaim with his globe, it ignores the members of the family who resided at Lisbon.

Searches in the Torre do Tombo, the Record Office at Lisbon, were no more successful than at Nuremberg. Sebastião Francisco de Mendo Trigozo tells us that when he proposed to write a Memoir of Martin de Bohemia he thought that the Royal Archives might yield some notices of which he stood in need, but that all his research proved unfruitful.³

Dr. Friedrich Kunstmann, the tutor of Princess Amelia of Brazil from 1841-46, had free permission to search, but found nothing to aid him in his historical work.⁴

Prof. Carl von Reinhardtstöttner, the learned author of a work on Camoens' '*Lusiadas*' (Strassburg, 1874), applied for information to the Ministerio da Marinha, on behalf of Dr. S. Günther, but was regretfully informed that they had nothing to offer him.⁵

I am myself indebted to my friend Captain Ernesto João de Carvalho e Vasconcellos and to Sr. Gabriel

¹ Joh. Christ. Gatterer, a distinguished historian and geographer, was born at Lichtenau, near Nuremberg, in 1727. He died 1799.

² '*Mem. de Litt. Port.*,' VIII., 1812. 2nd ed., 1856, p. 365.

³ Ghillany, P. III. Kunstmann was born at Nuremberg, took Holy Orders, and died 1867. He is the author of '*Die Entdeckung Amerikas*' (Munich, 1859), and of several papers dealing with the history of Portuguese explorations.

⁴ On Reinhardtstöttner (b. 1847) see Manuel Bernaldes Branco, '*Portugal e os Estrangeiros*' (Lisbon, 1879), with portrait.

⁵ Dr. Hartmann Schedel (b. 1440, d. 1514) was an indefatigable collector of codices and inscriptions. He settled at Nuremberg in 1484. His library was sold in 1552 to Hans Jacob Fugger of Augsburg, and the bulk of it is now in the R. Library at Munich (R. Stauber, über die Schedel'sche Bibliothek in H. Grauert's '*Studien u. Darstellungen a. d. Geb. d. Gesch.*,' VI., 1908). His famous chronicle was published in 1493.

Pereira of the Bibliotheca Nacional for valuable information, but none bearing upon Behaim's scientific labours.

It seems that the only official document discovered up till now which contains the name of Behaim is a Letter of Pardon—Carta de Perdão—of November 16, 1501, which King Manuel addressed to Fernão d'Evora, whom Joz d'Utra, jun., the Captain donatory, had sent in chains to Lisbon because he had "found him with one of his sisters, the wife of one Martin de Boeme."¹

It is of course quite possible that documents referring to Martin Behaim may have existed formerly in the 'Casa da Mina e India,' but like other documents of even greater interest they were either destroyed by fire or during the great earthquake of 1755, a loss now quite irreparable.

Not a single contemporary Portuguese writer mentions the name of Martin Behaim, not even Ruy de Pina² or Garcia de Resende, the authors of 'Chronicas' of João II., who must have known him personally, if not intimately, if he really was such a *persona grata* with the King as is claimed on his behalf by all his biographers and by members of his own family.³

Valentin Fernandes, or Ferdinand,⁴ the German printer, who settled at Lisbon before 1490, and acted as interpreter to Hieronymus Monetarius during his visit to Portugal in 1494, must have had personal knowledge of his countryman Martin Behaim, and heard about his African voyage and his supposed scientific attainments. Yet in the valuable accounts of Portuguese explorations which he collected up to the year 1540, the name of Behaim is not to be found.

¹ Published by E. do Canto, 'Arch. dos Açores,' IX., p. 195.

² Ruy de Pina's 'Chronica do Rey D. Johan II.' was first published in the 'Collecção de Livros ineditos,' t. II. (Lisbon, 1792). The author was Chronista mór of Portugal and Chief Keeper of the Torre do Tombo. He enjoyed the confidence of Kings John II., Manuel and John III., and died 1521. Garcia de Resende's 'Chronica do Rey Dom Ioão o II.' was printed at Evora in 1554. Both chroniclers were present at the King's death.

³ His brother Michael wrote to J. Poek on November 12, 1518, that Martin Behaim, "when young, was much liked by the old King (John II.), but how his affairs ended when he grew old you may know better than I" (Ghillany, p. 112).

⁴ Valentin Ferdinand was at first associated with Nicholas of Saxony. Among other works he printed a 'Livro das Viagens de Marco Polo' (1502). His accounts of Portuguese explorations are now in the Royal Library of Munich (Cod. Hisp., Cl. I., 27). The more interesting of the accounts referred to have been published by J. A. Schmeller, F. Kunstmann, Gabriel Pereira, and S. Ruge ('Abh. d. phil. Cl. d. Akad. d. Wiss.,' Munich, IV., VIII., IX.; 'Bol. da Soc. de Geographia,' Lisbon, XVII.; 'Revista Portug. Col. e Maritima,' Lisbon, 1900, Nos. 32-36; '27 Jahresh. d. Vereins f. Erdk.,' Dresden, 1901). A letter, describing a rhinoceros which Garcia de Noronha had brought from India in 1513, was written by Ferdinand to his "friends" at Nuremberg and is published by Count Angelo de Gubernatis ('Storia dei Viaggiatori Italiani,' Livorno, 1875, p. 389). An engraving of this rhinoceros by Albert Dürer is to be found at the British Museum (Add. MSS. 5220, f. 19). Ferdinand was a squire (escudeiro) of Queen Leonor and (since 1503) official broker (corrector) of the German merchants.

Duarte Pacheco Pereira,⁵ another contemporary, the "Achilles Lusitano" of Camoens (Canto x., 12), and author of an 'Esmeraldo de Situ Orbis,' a sailing directory for the coast of Africa as far as the Rio de Infante, occasionally refers to Cão and other explorers, but not once mentions the name of Behaim.

As to Behaim's "correspondence with numerous men of learning," it only existed in the imagination of Carlo Amoretti,⁶ the editor of Pigafetta's account of Magelhães' voyage. Some of these letters would surely have come to light had they ever been in existence.

Joachim Lelewel, one of the foremost authorities on the history of maps, would have us believe that "Behaim's renown was great in Germany, even in his lifetime," and that, though ignored in Portugal, "his name, in Germany, was in every mouth, occupied numerous pens, and the echoes of his glory resounded in Italy and in Spain."⁷ These assumptions are not supported by a single fact. Except in Schedel's 'Chronicle,' already referred to, his name will be sought in vain in the writings of his contemporaries. Conrad Celtes,⁸ who visited Nuremberg repeatedly between 1490 and 1498, that is during Behaim's stay in his native town, in his delightful book describing the Imperial city and its inhabitants, makes no reference either to the now famous globe or its author.

Even Dr. Hieronymus Muntzer or Monetarius, who gave Behaim a letter of recommendation to King John, in 1493, and who during a visit to Lisbon in 1494 was actually the guest of Behaim's father-in-law, does not mention the name of his old acquaintance, either in his 'Itinerarium' or in his 'De inventione Africae.'⁹

⁵ Duarte Pacheco Pereira was born at Lisbon in 1450, served on the Guinea coast, 1482-83, went out to India with Cabral in 1500, and again with Afonso de Albuquerque in 1503; returned to Lisbon in July, 1505; was governor of S. Jorge da Mina, 1520-22, and died 1533. He wrote his 'Esmeraldo de Situ Orbis' after 1505. It was published only in 1892 with an introduction by Raphael Eduardo de Azevedo Basto, Keeper of Records at the Torre do Tombo.

⁶ Carlo Amoretti, a learned priest, was born at Oneglia in 1741, was appointed head of the Ambrosian Library at Milan, and died in 1816. The 'Primo viaggio intorno al globo terraqueo' was published in 1800.

⁷ 'Géographie du moyen âge,' t. II., p. 137 (Brussels, 1852). Lelewel was born at Warsaw in 1786, had to fly Poland after the insurrection of 1830, and died in Paris in 1864.

⁸ Conrad Celtes, or Pickel, a peasant's son, was born at Wipfeld in 1459, won fame as a poet, patriot, geographer, and champion of Humanism. He died 1508. His 'De origine, situ, moribus et institutis Norimbergae libellus' (1495) was dedicated to the City Council, who awarded him 8 gulden (£4) as an honorarium, which he returned in disgust, whereupon the Council in 1502 sent him 20 gulden. On Celtes see B. Hartmann, 'Konrad Celtes in Nürnberg' (Nürnberg, 1889), and L. Gallois, 'Les Géographes allemands de la Renaissance' (Paris, 1890), pp. 173-180, where his merits as a geographer are dealt with.

⁹ Hieronymus Muntzer was a native of Feldkirch in Vorarlberg, studied medicine at Pavia, and settled at Nuremberg in 1478. When Nuremberg was invaded by the plague in August, 1494, he fled the town and started upon a tour which, in November, brought him to Portugal. At Evora (November 16-26) he was introduced to King John and dined

The earliest Portuguese writer who mentions Behaim is the famous historian João de Barros,¹ and his statement in 'Da Asia' (Dec. I., lib. IV., c. 2) is indeed the only authority which connects him with the 'Junta dos mathematicos' appointed by King John II. It has been quoted, commented and enlarged upon by numerous later authors, and shall be fully dealt with by me in its proper place.

Almost equally controverted is the statement of Antonio Pigafetta,² the historian of Magellan's voyage, with respect to a chart showing a strait connecting the Atlantic with the South Sea, the authorship of which is ascribed by him to Behaim.

The only other early writer whom I need mention in this place is Dr. Gaspar Fructuoso,³ a learned Jesuit, the author of 'Saudadas da terra,' where are to be found a number of anecdotes, collected locally, and of doubtful authority.

The modern authors whom I shall have to quote as illustrating the history of Martin Behaim are very numerous. Foremost among them are Alexander von Humboldt, Cardinal D. Francisco de S. Luiz Saraiva,⁴ Dr. Arthur Breusing,⁵ Ernesto do Canto,⁶ Oscar Peschel,⁷ Dr. Sophus Ruge,⁸ Dr. F. von

Wieser,⁹ Harry Harrisse,¹⁰ Eugen Geleisch,¹¹ and Hermann Wagner.¹²

I shall now mention the biographies of Martin Behaim which have been published up to this time.

Passing over the worthless biographic notice in the 'Bohemia docta' of Bohuslav Balbinus,¹³ published posthumously in 1776, the frivolous panegyric of J. Chr. Wagenseil,¹⁴ and the equally worthless publications of his blind followers, which are dealt with at some length in c. IX, the earliest biographer deserving to be mentioned is Joh. Gabriel Doppelmayr,¹⁵ the author of 'Historische Nachrichten von den Nürnbergischen Mathematicis und Künstlern' (Nurnb., 1780). He, too, accepts Wagenseil's gross perversion of historic truth, but we are beholden to him for the first facsimile of the globe, which, though on a small scale, is accompanied by copies of the most important of its legends. Christoph Gotlieb von Murr's¹⁶ 'Diplomatische Geschichte des portugiesischen berühmten Ritters Martin Behaims' (Nürnberg, 1778, 2nd edition Gotha, 1801), is the work of a conscientious author, well qualified for his task by preceding historian and antiquarian researches. His work is largely based upon documents; the claims put forward by Wagenseil on the false assumption that they would redound to Behaim's honour, are finally refuted, and even though the author mistook the birth-year of Martin Behaim the father for that of the son—a most inexcusable error considering that he had free access to the family archives—his little book fully deserved the honour of being translated into French and Spanish.¹⁷ It supplied weapons to those who, in after years, stood up for

four times at the Royal table. He again left Lisbon on December 2, 1494, and was back at Nuremberg on April 15, 1495. He died in 1508. See Schmeller ('Abh. d. bayr. Ak.', 1847), and Kunstmann (ib., 1855). Dr. G. von Laubmann, who examined Mäntzer's MSS. in the Munich Library, informed Dr. Harrisse ('The Discovery of North America,' p. 397) that the name of Behaim is not to be found in them.

¹ João de Barros was born at Vizeu in 1496, was appointed governor of Elmina in 1522, and held the post of treasurer of the India House from 1532-63. He died in 1570. His official position gave him access to documents no longer available. Decada I., which alone concerns us, was published at Lisbon in 1552.

² Pigafetta was born at Florence in 1480, came to Spain in 1519, and after his return from the first voyage round the world, returned to Italy in 1544. Ramusio, in 1556, first published an account of his voyage.

³ Gaspar Fructuoso, S.J., was born at Ponta Delgada, S. Miguel, of wealthy parents, studied at Salamanca and was appointed parish priest of Ribeira grande, S. Miguel, where he died in 1591. His 'Saudadas' were utilized by Antonio Cordeiro, S.J. (b. at Angra, Terceira, 1641, died at Lisbon 1722) in a 'Historia insulana' (Lisbon, 1717). Manuel Pinheiro Chagas, 'Os descobrimentos Portuguezes e os de Columbus' (Lisbon, 1892), p. 164, speaks of this Cordeiro as "one of those historians who think it allowable to state what they know to be false as long as it redounds to the glory of their country."

⁴ 'Obras completas do Cardeal Saraiva' (Lisbon, 1875), t. V., pp. 180-3, 190-200, originally written in 1841.

⁵ A. Breusing was born at Osnabrück. From 1850 to his death in 1892, he was director of the Navigation School at Bremen (Wolkenhauer, in 'Verh. d. Ges. f. Erdk.' 1892): 'Geogr. Jahrbuch,' XVI, 1893, p. 478).

⁶ 'Arquivo dos Azores,' 1878-94.

⁷ Oscar Peschel, one of the most fertile and original writers on geography, was born at Dresden, 1826; was appointed Professor of Geography at Leipzig University, and died there in 1875.

⁸ S. Ruge, one of the foremost authorities on the history of geographical exploration, author of 'Geschichte des Zeitalters der Entdeckungen' (Berlin, 1881), was born at Dorum in 1831, held the post of Professor of Geography at the Technical High School at Dresden, and died there in 1903.

⁹ Wieser was born at Kufstein in 1840 and is Professor of Geography at the University of Innsbruck.

¹⁰ Harrisse, the author of numerous fundamental works dealing with Columbus and the discovery of America, was born in 1830, and is still indefatigably engaged upon his fruitful researches.

¹¹ Geleisch, formerly director of the Nautical School at Lussinpiccolo, was born in 1854.

¹² H. Wagner, Professor of Geography in the University, Göttingen, and the foremost authority on the History of Maps, was born at Erlangen in 1840.

¹³ B. Balbinus, S.J., was born at Königgrätz in 1621 and died at Prague in 1688. His 'Bohemia docta,' edited by Raphaele Unger, was published in 1776.

¹⁴ Wagenseil, a man of much learning and great reputation, born 1633 at Nuremberg, died 1705.

¹⁵ Doppelmayr was born at Nuremberg, 1671, and died 1759.

¹⁶ Murr, the historian, antiquary and critic, was born at Nuremberg 1733, and died at Altdorf, 1811.

¹⁷ The French translation was made by H. J. Jansen, and was published in the 'Recueil des Pièces intéressantes concernant les Antiquités, les Beaux-Arts, les Belles-Lettres, et la Philosophie,' t. I. et II. (Paris, 1727). It was reprinted in 1801, as an appendix to a French translation of Amoretti's edition of Pigafetta. A third edition, revised by Murr himself, was published in 1802 at Strassburg and Paris. The Spanish translation is by D. Cristóbal Cladera ('Investigaciones historicas,' Madrid, 1796, pp. 173-218).

Columbus and Magellan, when their claims as "discoverers" were called in question. Sebastião Francisco de Mendo Trigozo, the author of a 'Memoria sobre Martin de Bohemia' ('Memorias de Litteratura Portugueza,' t. VIII., 1812; 2nd ed. Lisbon, 1856) is almost wholly dependent upon Murr for his facts.

After a long interval Dr. Friedrich Wilhelm Ghillany,² a man of learning and from 1841-53 Chief Librarian of the Town Library at Nuremberg, presented us with a 'Geschichte des Seefahrers Ritter Martin Behaim' (Nürnberg, 1853), an ambitious work, to which is prefixed an Essay by A. von Humboldt on the oldest maps of the new continent and the name 'America,' and which is illustrated by what claims to be an "exact copy of Behaim's globe on its original scale." Ghillany did his work with much industry; he dealt with Behaim's life and controverted points of his history as fully as the materials at his command permitted, and it might be supposed that the last word had been spoken on the subject. Such, however, was not the case, as is proved by Dr. Siegmund Günther's³ 'Martin Behaim' (Bamberg, 1890), which made known new documents which shed much light upon certain periods of Behaim's history, and thus produced a work at once popular and indispensable to the student of history. The account which Lucien Gallois renders of Behaim's life and work,⁴ as we have a right to expect from its gifted author, is instructive, but fails to shed fresh light upon subjects in dispute; the article in the 'Allgemeine Deutsche Biographie,' by J. Löwenberg⁵ is disappointing, if not worthless, and it seems a pity that this biography was not entrusted to a more painstaking writer; whilst A. Reichenbach's 'Martin Behaim, ein deutscher Seefahrer' (Leipzig, 1869) may be a good 'Volksbuch,' but cannot be appealed to as an authority.

In the work which I now venture to present to the public I shall deal with sufficient fulness with Martin Behaim's private life, his supposed scientific attainments and his voyage along the coast of Africa, and I shall give equal attention to a full description of his globe, which is still preserved at Nuremberg, and which, whatever its defects, is one of the most valuable and interesting

geographical monuments of the age immediately preceding the discovery of America. This globe, up till now, has not been fairly dealt with. Its legends, indeed, have in part been quoted and a few of its geographical names, but no real facsimile of it has ever been published, still less have the authorities been traced and analysed upon whom its delineation of the earth's surface is based. The facsimile which I now present to the public may not be the best that could have been produced, but it is at all events on the scale of the original, and contains all its legends, names and miniatures not to be found in any of the pseudo-facsimiles published hitherto. In my work I also deal in some detail with the materials available in 1492 for compiling a map of the known world, thus enabling the reader to form some judgment of the skill with which the cartographers of that period have availed themselves of the materials which were at their disposal.⁶

In conclusion I feel it my duty to express my thanks to a number of gentlemen who have kindly given me their assistance. At Nuremberg my thanks are especially due to the Barons F. and W. Behaim, who not only allowed me to take photographs of the globe, of the portrait of their kinsman, and of a letter written by him, but also permitted to be printed from an original block by Albert Dürer a design of their coat of arms. They likewise afforded to myself and my kind friend, Professor M. J. Rackl, repeated opportunities for examining the globe. Facilities for research were most courteously granted me by Dr. G. von Bezold, Director of the Germanic Museum, Dr. E. Mummenhof, Keeper of the City Records, and Dr. E. Reicke, city librarian. Dr. G. von Laubmann, Director of the Royal Library at Munich, and Sr. Gabriel Pereira, of the Bibliotheca Nacional, have most readily responded to my numerous inquiries for information. Dr. K. R. Scheppig, Director of the Anthropological Museum at Kiel, has generously placed at my service valuable information collected by himself for a work on Behaim upon which he is engaged. M. G. A. Marcel, Keeper of Maps at the Bibliothèque nationale at Paris, has afforded me every facility for making a copy of the real facsimile of Behaim's globe in his charge. Among many others my thanks are due more especially to Sr. Raphael Eduardo de Azevedo Basto, chief of the Torre do Tombo, Consul-general H. Daenhardt, and my friend Captain E. J. de Carvalho e Vasconcellos at Lisbon; the family of Count Mirbach of Schloss Harff, D. Jules Mees, Professor Albrecht Penck, Dr. Henry Vignaud and others.

¹ S. F. de Mendo Trigozo wrote in 1812.

² Ghillany was born at Erlangen in 1807 and died in 1876. Already in 1842 he had published a pamphlet, 'Der Erdglobus des Martin Behaim vom J. 1492, u. der des Johann Schoener vom J. 1520,' with a reduced facsimile of the Western Hemisphere by Heideloff, a drawing master.

³ S. Günther, Professor of Geography at the Technical High School of Munich, is one of the great authorities on mathematical and historical geography. He was born at Nürnberg in 1848.

⁴ 'Les géographes allemands de la renaissance' (Paris, 1890), pp. 25-37. L. Gallois, Professor at the École normale supérieure at Paris, was b. 1857.

⁵ J. Löwenberg, a writer on the history of geographic exploration, was born at Strzelno (Posen), and died at Berlin, 1853.

⁶ The present work supersedes as a matter of course the author's essay, 'Martin de Bohemia,' 8vo, pp. 68, published in the 'Bibliotheca da Revista Portuguesa colonial e maritima,' Lisbon, 1900.



Kgl. Hof- und Buchdruckerei G. P. J. Stilling-Wieh, Nürnberg.

THE LIFE.

I. OLD NUREMBERG.

NUREMBERG by the middle of the fifteenth century had grown from a small village nestling at the foot of the sandstone rock crowned by the castle built by the Emperor Conrad II. into one of the most famous and wealthiest cities of the Empire.¹ Her merchants were the rivals of those of Augsburg and Frankfurt, and much of the profitable spice-trade, of which Venice still enjoyed an almost undisputed monopoly, passed through their hands. They had branch establishments in Italy, France and the Low Countries. The artisans of the city were renowned for their skill and ingenuity. Noble churches and striking civic buildings, which are still the delight of visitors to the old Imperial city, existed even then, and bore witness to the piety, taste and prosperity of its citizens. And the ensuing century brought to the front quite a number of men—natives of Nuremberg or residents—whose reputations, after the lapse of more than four centuries, are still green among the living. Prominent among these were Adam Krafft (1480–1507), whose statues, renovated, still adorn the road to the cemetery of St. John; Michael Wolgemut (1484–1519), and his more famous pupil Albrecht Dürer (1471–1528), one of whose designs, thanks to the kindness of Baron Behaim, ornaments this volume; Peter Vischer (1455–1529), the sturdy sculptor and founder; Veit Hirschvogel (1461–1525), the painter on glass; Johannes Müller of Montereio (Königsberg), the most famous astronomer of his age, who, though not a native of Nuremberg, resided in that city from 1471–75, and would have returned to it had not death carried him off prematurely at Rome, in 1476; Bernhard Waltherr (1480–1504), the wealthy merchant, who built an observatory for his friend and teacher Johannes Müller; Willibrand Pirckheimer (1470–1530), the learned statesman, warrior and patron of artists and men of science; Johann Werner (1468–1528), the astronomer; Hans Sachs (1494–1576), the Meistersinger; Anthoni Koberger, who, between 1470 and 1513, printed and published 276 books, and many others of less note.

And Nuremberg was not only the centre of a far-reaching commerce, the seat of flourishing industries and of the arts; the city was likewise politically one of the

most important in all Germany. The Imperial Parliament or *Reichstag* had met there repeatedly ever since 1073; the Emperors frequently took up their quarters in its *Burg*; and in 1424 the city authorities were entrusted with the custody of the crown jewels, which remained there up to 1796, when they were removed to Vienna.

The government of the city was frankly oligarchical, for, with the exception of eight representative craftsmen, admitted after an insurrection in 1349, only members of about fifty families were eligible for seats on the City Council or *Rat*. These patrician families or *Geschlechter* owed their privilege to the wealth acquired by trade or commerce; and a personal dignity at first conferred upon individuals of merit by their fellow-citizens in course of time became hereditary.² It must, however, be admitted that they exercised the powers usurped by them with honesty, fairness, and business capacity, which is more than can be said of the popularly elected Councils of certain of our modern cities, notorious for their extravagance, mismanagement and even corruption.

II. THE BEHAIMS OF SCHWARZBACH.

The Behaims of Schwarzbach, in the fifteenth century, already occupied a prominent position among the *Geschlechter* or Patricians of Nuremberg. The founder of the family is supposed to have left his native place of Schwarzbach in the Bohemian district of Krumlau, in consequence of the persecution suffered by the Christian inhabitants after the death of Duke Wratislaw in 916. This tradition is confirmed, to some extent, by the family name, for Behaim, or Beheim, merely means "Bohemian," the modern "Boehm," whilst the wavy bend *sable*, which crosses the family shield diagonally, is clearly intended to

¹ In 1449 Nuremberg had 45,307 inhabitants, of whom 25,085 were "residents."

² The *Rat* or City Council included 48 members, viz., 26 *Burgomasters* (13 *Ratmannen*, Consules or Councilmen, and 13 *Schöffen*, Assessors), 7 *alte Herren* ("old gentlemen"; aldermen or septem viri), 7 *alte genannnte* (seniori), and 8 representatives of craftsmen. The *Kleine Rat* (Senatus) included 3 *oberste Hauptleut* (Captains or triumviri), 2 *Loewinger*, who had charge of the finances and were the real heads of the city, and the 7 *alte Herren*. In addition to these privileged families there were those entitled to the title of *Erbar* (honourable or worshipful), related by marriage to the *Geschlechter*; merchants and manufacturers, land or houseowners, and members of the learned professions; shopkeepers, and handicraftsmen.

represent the Schwarzbach or "Black beck."¹ At Nuremberg the Behaims engaged in trade, acquired wealth, gained admission among the patrician families and assumed a coat of arms. As early as 1382, a member of the family, one Albrecht Behaim, a grocer, was elected one of the burgomasters of the city, and occupied that honourable position until 1342. The Senate of Nuremberg was consequently fully justified when, in a letter addressed to King Manuel on June 7, 1518,² on behalf of Martin Behaim's son, it spoke of "*familia Bohemorum in civitate nostra Nurembergensis ultra ducentos annos honestissime et egregie perdurasse*." In a second letter the senate, as if doubtful whether the king would recognise the members of Patrician families as "noblemen," added that the family held likewise several feudal estates outside the city. These estates included two male fiefs at Rückersdorf, near Lauf, on the Pegnitz, and at Kurssendorf (Kurzendorf), a few miles to the south of Ansbach, as also a grange at Katerbach, to the north of Ansbach conferred by the Bishop of Würzburg.³

Martin Behaim,⁴ the father of the "Navigator," was the younger son of Michael Behaim (b. 1400) and of E. Hirschvogel. He was born on November 10, 1437,⁵ married, in 1458, Agnes, the daughter of Wilhelm Schopper and Mistress Muffel, was elected Senator in 1461, and died on August 6, 1474. He was a general merchant, and in his younger years business had taken him as far as Venice. His wife survived him thirteen years and died on July 8, 1487. She had borne her husband seven children, of whom Martin, the subject of this history, was the eldest and cannot therefore have been born earlier

than 1459.⁶ Among the executors of her last will and testament is to be found the name of Bartholomew von Eyb, whom I shall have occasion to refer to later on, in connection with Martin's commercial training. Both parents were buried in the church of the Dominicans.

In what follows I shall give some information on the children of Martin Behaim and Agnes Schopper.

Martin Behaim, the eldest of the three sons, was probably born in 1459, and will be fully dealt with later on.

Stephan, the second son, was born about 1460, married Margareta Ortolph in 1500, and died in 1511. He was Assessor of the City Court and of the Court for matrimonial causes. He left two sons, of whom his brother Michael writes in 1518 that the elder was intended for the priesthood, whilst the younger was not very robust (*notvest*).⁷ His widow married Hans von Obemitz, who subsequently held the post of Imperial bailli or *Reichsschulteis*.

Michael, the third son, is stated to have been born in 1474. He married Catherina Lochner in 1495, was knighted (probably by the Emperor Maximilian), elected a member of the Senate in 1502 and died in 1522. He had no children, a fact which he deplores in a letter to Jörg Pock, written in 1518. His widow died in 1527. It was Michael who at the request of the Emperor Maximilian, during a visit to Nuremberg in November, 1500, consulted the antiquary Sebald Schreyer why an eagle on one of the ceilings of the *Burg* was painted yellow instead of black as usual.⁸ Michael took a friendly interest in the son of his brother Martin.⁹

Wolf or *Wolfrath*, the youngest of the brothers, and hence occasionally referred to as *Wölfflein*—Little Wolf—spent most of his life abroad. Between 1491 and 1496 he was at Lyons, in the service of the Tucher, and subsequently at Geneva. Letters from him during this period are still extant, but they only contain two incidental references to his brother Martin, which shall be quoted in due course. On February 2, 1503, whilst on a visit to Nuremberg, he rode in a tournament, and was awarded the seventh prize. In 1505 or 1506 he came to Lisbon, as agent of his maternal uncle Hirschvogel, and died there on March 20, 1507, a bachelor. He was buried in the church of Sta. Maria da Conceição, by the side of Paulus Imhof or Incurio,¹⁰ a fellow townsman. Wolf seems to have dabbled in science, for genealogists refer to him as "astrologus."

¹ The following is a description of the coat of arms of the Behaims:—Shield *gules* and *argent*, party per pale, and charged with a wavy bend *sable*. Crest: a white phoenix, rising, with black collar. I am able—thanks to the kindness of Baron Behaim—to present the readers with a design of this coat by Albert Dürer, together with a copy of the letter written by the famous artist (see Appendix XIII).

² The Behaims of Schwarzbach had no doubt done excellent service in the government of their city, but none amongst them had won distinction in art, science or literature, whilst several namesakes of theirs, not belonging to the family, had done so. Dr. Christoph Scheurl (whose interesting autobiography is published in the 'Mittheilungen d. Vereins für die Geschichte Nürnberg's,' V.) in an obituary on Dean A. Kress (1513), who was succeeded by a nephew of the famous architect Hans Behaim, had the temerity to dwell upon this point, whereat the Town Council felt highly indignant, severely reprimanded him, and ordered this obituary to be suppressed (G. W. K. Lochner, 'Allgem. Deutsche Biographie.' G. W. Lochner was born 1798, and died 1882.

³ For the two letters of the Senate, see Appendix XII. The three feudal estates are mentioned by Lochner, 'Selecta Archivalia,' I, 243, and Günther, p. 7.

⁴ The numerous MS. "genealogies" to be found at Nuremberg abound in discrepancies and obvious mistakes, nor is J. G. Biedermann's 'Geschlechtsregister des hochadligen Patriciats in Nürnberg' (Baireuth, 1745) always to be trusted.

⁵ Ghillany (p. 17) opines that he must have been born earlier, say in 1430, as there are still extant letters written by him between 1455 and 1457, when he was travelling and collecting debts due to the firm. He publishes two of these letters, and thinks he must have been older than eighteen when entrusted with such duties. However, 1437 is the date given in all genealogies and in the 'Familienbuch.'

⁶ Murr (p. 45), who saw the letters referred to above, erroneously assumed them to have been written by Martin the son, and thus was led into making serious mistakes as to dates. The subject is fully discussed by Ghillany, pp. 10, 25.

⁷ Michael to Jörg Pock (Ghillany, p. 112).

⁸ Ghillany and C. Heideloff, 'Der deutsche Adler und die deutschen Farben,' Stuttgart, 1848, p. 9.

⁹ For letters written by him in 1507 (to his nephew) and in 1518 (to Jörg Pock), see Ghillany, pp. 107–113.

¹⁰ According to Pock's letter of March, 1519 (Ghillany, p. 114), but see c. xv.



THE HOUSE IN WHICH BEHAIM WAS BORN.

From a Photograph by F. Schmidt.

Ursula, though stated to have been born as late as April, 1478, seems to have been the eldest of the three sisters. In 1489 she married Ulrich Futterer, a wealthy merchant, who left her a widow in 1524. She survived him until October 29, 1529.

Elsbeth, said to have been born in 1466, became a nun in the convent of Sta. Clara, and died in 1536.¹

Magdalena entered the convent of St. Catherine in 1482, and died there in 1538. Her aunt, Anna Schopper, likewise lived in this convent, which had been founded in 1380, and the chapel of which is still used as a place of worship.

Among other members of the family are the following:—

Leonhard, the elder brother of Martin's father, born about 1432. He married Kunigunde Volkamer in 1455 and died in the family mansion in Zistel Street,² on December 1, 1486. His wife, born in 1438, died in 1488 (or 1496). He was a member of the Senate. After his brother's death he took an active interest in the widow and orphaned children. Martin Behaim addressed this uncle as *Vetter* or cousin, and kept up a desultory correspondence with him for twenty-four years.

Michael, a son of Leonhard, was born in 1459. He was therefore of the same age as his cousin Martin. He, too, was intended for a commercial career, for in 1478 he was sent to Vienna, into a grocery business;³ but later on he settled at Nuremberg, where he married, and held several municipal offices, and, like other members of the family, advanced to the dignity of Senator. He died in 1511, his wife, *née* Winter, surviving him until 1519. Martin Behaim, during his visit to Nuremberg, 1490-93, resided with this Michael, and Wolf corresponded with him up to the time of his death, in 1507.

Frederick, a son of Michael, born 1491, married an Imhof, and died in 1538.

III. EARLY YEARS, 1459-1476.

THE house in which Martin Behaim was born has undergone many alterations since the fifteenth century, but its windows still look out upon the spacious market-square, the scene of sports and tournaments in Behaim's day, and the eyes dwell with delight upon the richly-carved front of St. Mary's Chapel, the brightly-coloured "Beautiful Fountain,"⁴ and quite a number of gabled

houses. Illustrated inscriptions in German inform the beholder that "Martin Behaim the Navigator, and Maker of the famous globe, was born in this house about the year 1459," and that "In front of this house were exhibited to the people, on the second Friday after Easter, from 1425 to 1520, the Imperial Crown Jewels and relics."⁵ These Crown Jewels had been entrusted to the keeping of Nuremberg by the Emperor Sigismund of Brandenburg, and up to 1796 were kept in the Church of the Holy Spirit,⁶ when they were appropriated by the Emperor Franz II. and carried to Vienna, where they still are.

Young Martin was intended to follow a commercial career, and he received, no doubt, the most perfect education suitable to his future which the Nuremberg of those days afforded. We might thus assume him to have attended the best of the four grammar schools connected with the parish churches, namely, that of St. Sebald, where the scholars spent four hours daily in learning reading, writing, Latin, and Logic, and two in choir practice.⁷ It is possible, however, that like other boys of "good" family, he attended a select private school, and may even have been allowed the luxury of a *Hofmeister*, or tutor, who accompanied him to school and superintended his lessons and general conduct when away from it.⁸ His commercial training he received, as a matter of course, in his father's business, after whose death, in 1474, the interests of the youth were looked after by his uncle Leonard, and by Bartels (Bartholomew) von Eyb, a friend of the family and one of the executors of the last will and testament of his mother.

As a result of this course of instruction young Martin gained a competent knowledge of reading, writing and arithmetic, as also a fair acquaintance with Latin, and, as a matter of course, with commercial affairs, but if he really and truthfully boasted at Lisbon, as asserted by João de Barros,⁹ of having been a pupil of Regiomontanus, we should expect him to have been likewise

⁵ *Martin Behaim der Seefahrer und Verfertiger des berühmten Globus wurde in diesem Hause geboren um das Jahr 1459.*

Vor diesem Hause wurden von 1425 bis 1520 am 2 Freitag nach Ostern die Reichskleinodien und Heiligtümer dem Volke gezeigt.

The illustrative designs are plainly visible in our illustration. For an illustrated description of the Crown jewels see Murr, 'Beschreibung der sämtlichen Reichskleinodien oder Heiligtümer welche in Nürnberg aufbewahrt werden,' Nürnberg, 1790.

⁶ The Heilige Geist or Spitalkirche was built 1333-41.

⁷ According to Heerwagen ('Zur Geschichte der Nürnberger Gelehrtenschulen,' Nürnberg, 1860) the four grammar schools attached to the churches of St. Sebald, St. Lorenz, St. Egidia, and Holy Trinity were attended, about 1485, by 245 paying pupils, and there were 4 schoolmasters, 4 cantori, 7 baccalaurei, and 3 locati or caretakers. In 1485 the Town Council reformed these schools. The fees were reduced and the choir practices restricted to Sunday.

⁸ Dr. Günther refers for authority for such a statement to the autobiography of Christoph Scheurl, a contemporary of Behaim, published by Prof. Chr. G. A. von Scheurl (b. 1811, d.), one of his descendants, in the 'Mith. d. Vereins für die Geschichte Nürnberg's,' Heft V., p. 13.

⁹ 'Da Asia' (Lisbon, 1778), t. I., p. I., p. 282.

¹ This convent was founded in 1380, and is at present used as a municipal pawnshop.

² Now No. 4 Albert Dürer Street, a house of business.

³ See Martin Behaim's letter of September 17, 1478. The letters, written between 1455-7 and published by Ghillany, pp. 101-2, are by Martin's father.

⁴ The "Schöne Brunnen" with its numerous statuettes is stated to have been erected between 1385 and 1396. It has recently been restored and regilt.

a good mathematician and astronomer. Johannes or Hans Mueller of Königsberg in Franconia, according to Conrad Celtes,¹ *facile princeps* among the mathematicians and astronomers of his age, resided at Nuremberg from the spring of 1471 to July 1475, when, unhappily, he accepted an invitation to go to Rome in order that he might advise on the proposed reform of the Calendar.² Martin, at that time, was between twelve and sixteen years of age, and might well have profited from the instructions of so gifted a teacher. But as Regiomontanus never taught or lectured in public whilst at Nuremberg,³ such knowledge as Behaim is assumed to have possessed can only have been obtained by private intercourse, or in the course of occasional visits which he paid to the observatory and workshop which the great astronomer owed to the liberality of his wealthy patron and pupil Bernhardt Walther.⁴ At all events it may be granted that Martin Behaim personally knew Regiomontanus, for that astronomer was a popular figure in Nuremberg of whose residence among them the citizens were not a little proud. We doubt, however, whether Behaim was justified when he spoke of himself as a "disciple" of the great master. At all events, even if there was the slightest claim to such a distinction he profited little by the instruction received, as will appear in the course of our essay.

IV. IN THE NETHERLANDS, 1476-84.⁵

Martin Behaim at Mechlin, 1476-79.

On the termination of his apprenticeship, in 1476, young Martin was sent abroad in order that he might improve his technical and commercial knowledge. He was first placed with Jorius van Dorpp, a cloth-merchant of

Mechlin, with whom he remained for over a year. Mechlin was a dull place, but even then famous for its lace and cloth, and boasted of an ancient cloth hall and a cathedral, built out of the offerings of pilgrims who flocked thither to win the indulgences promised to worshippers at the shrine of St. Rombold. Whilst at Mechlin he witnessed, on April 18, 1477, the arrival of the embassy of Frederick III., King of the Romans, which was to solicit the hand of Mary, daughter and heiress of Charles the Bold,⁶ for his son Maximilian. The nuptials took place in due course on August 19 at Ghent. The people, so Behaim tells us, had looked forward to this event with "much gladness," for they hoped that Maximilian would at once take the field and drive the French out of Artois, Hainaut and Flanders, which they had invaded in the beginning of the year, and where they had burnt villages, sacked towns, and committed untold-of atrocities. They were doomed to disappointment. A truce was indeed agreed upon at Lens (September 18, 1477), but its terms were little respected by the French. Behaim, writing from Mechlin on October 13, 1477, tells us that whilst the country was being laid waste, "the young gentleman of Austria lay at Brügge with his fair wife." He adds that the public treasure had been expended by the late Duke in continuous wars, that no measures had been taken to meet the French in the field, and that all the world grumbled. As to himself, however, his uncle need fear nothing, as the French were still 16 miles⁷ from Mechlin, and would have to capture four big towns before they could appear before its walls.

Visits to the Fairs at Frankfurt were included in the scheme of Behaim's commercial education. The first of these visits was to have been paid at Easter 1477, but as the roads were not safe at that time for travellers, Jorius van Dorpp preferred to sell his cloth direct to a German merchant at Antwerp. Later in the year Martin, by desire of his mother, visited the autumn fair, when he was initiated by his fatherly friend, Bartels von Eyb, into the mysteries of buying and selling.⁸

Martin Behaim at Antwerp, 1479-84.

He was once more at Frankfurt in the following autumn, and in a letter written to his uncle Leonhard, on September 18, 1778, he suggested a removal from Mechlin,

¹ 'De origine, situ, moribus et institutis Norimbergae libellus,' Norimb., 1492, c. vi. See p. 2, Note 8.

² He died at Rome, July 6, 1476. See Günther's Biography in the 'Allgemeine Deutsche Biographie.'

³ It was Pierre de la Ramée (Petrus Ramus), the great French scholar and opponent of Aristotelian dialectics, who in his 'Scholae mathematicae,' 1569, mistakenly credited the Town Council of Nuremberg with having engaged Regiomontanus to deliver public lectures both in Latin and in German. G. H. Schubert, 'Peurbach und Regiomontanus' (Erlangen, 1840), p. 35, speaks of this as a 'well-authenticated tradition,' but F. C. Hagen, 'Programm der Handelsschule, 1888-9,' proves that the first public teacher was only appointed in 1477. On this subject consult S. Günther, 'Geschichte des mathem. Unterrichts im deutschen Mittelalter,' Berlin, 1887. Petrus Ramus was born 1515, and died one of the victims on the night of St. Bartholomew, August 24, 1572.

⁴ Bernhardt Walther (b. 1430, d. 1504), fitted up for his friend an observatory, a workshop for making astronomical instruments and globes, and a printing office from which were issued the famous 'Ephemerides' (1474) and other works.

⁵ The letters written by Behaim from Mechlin (April 17 and October 13, 1477), Frankfurt (September 17, 1478), and Antwerp (June 8, 1479), as well as the important legal documents drawn up at Nuremberg on February 13, 1489, will be found in the Appendix, pp. 107-111. There are no documents for the years 1480, 1481 and 1482.

⁶ Charles the Bold, Duke of Burgundy, fell before Nancy on January 5, 1477. On Maximilian's marriage, see U. Legeay, 'Histoire de Louis XI.' (Paris, 1874, II., p. 279), and Kervyn de Lettenhove, 'Histoire de Flandres' (Bruges, 1874, IV., p. 159). The embassy was headed by the Electors of Treves and Mayence, and among its members were the Markgraves of Brandenburg and Baden, Duke Louis of Bavaria, and others. The ambassadors were attended by George Hesler, the Chancellor of the Empire, and by five or six hundred spearmen.

⁷ An exaggeration, if the ordinary German miles are meant. The French, at the time, were certainly at Tournai, which they had occupied on May 23, and which is no more than 12 German miles from Mechlin, as the crow flies.

⁸ See his letter of October 13, 1477. Appendix II.

expressed a desire to be placed with good (*fromme*) people engaged in commerce, declared his willingness to be bound for three years, and promised to shirk no drudgery as long as it would help him in his business career. This question of a change was no doubt considered by his mother, his uncle and by Bartels von Eyb, the friend and adviser of his mother, for early in the following year, if not before, we find our young merchant transferred to the cloth-dye-house of Fritz Heberlein, a Nuremberger established at Antwerp. That city, in the course of the fifteenth century, had grown into the most important seaport of the Netherlands, partly in consequence of the decay of Brügge, due to the silting-up of the Zwyn, which up till then had permitted sea-going vessels to sail up to that city, but more especially owing to the Scheldt having excavated for itself a more direct course to the sea which enabled vessels of the largest burden to proceed up to the wharves of the town. To judge from a letter which young Martin wrote to his uncle Leonhard on June 8, 1479,¹ he was well pleased with his stay there. He was a favourite with his master and the members of the household, whilst the foreman, in return for being taught arithmetic,² initiated him into all the mysteries of the cloth-trade. He worked at his trade like any other journeyman, and in proof of the busy life he led he states that notwithstanding that there was but one other journeyman beside himself, his master, in the course of a year, finished and set quite 900 pieces of cloth belonging to about a dozen merchants. Behaim, whilst in the service of Heberlein, was permitted to speculate in cloth on his own account on condition of the cloth being dyed in his master's dye-house. Three hundred gulden³ which he had received from his mother, at the last Frankfurt Lent-fair, had been invested by him at the Bergen fair⁴ in English white cloth, which the men in the dye-house pronounced to be of very superior quality. This cloth, when he wrote his letter, had already been teased, raised and cut; it was to be dyed in the course of a week, after which it would be set, finished, and folded, and forwarded to Nuremberg, where he hoped it would realise a good profit. He takes this opportunity to express a wish for a senior partner, who would put money into the business, and by whose experience he might profit. Every business, he tells his uncle, should be carried on in partnership, one partner to buy, the other to sell.

¹ See Appendix IV., p. 109.

² Algorithm, or ciphering, according to the decimal notation, as employed by the Arabs, first described by Leonardo Bonacci, of Pisa, in his 'Liber Abaci,' 1202.

³ Each of these gulden was worth about 10 shillings.

⁴ Mr. B. J. Mes, Keeper of the Archives of Bergen-of-Zoom, kindly informs me that the town had two fairs annually, one a *Voorjaarmarkt*, which began a fortnight after Easter and lasted three weeks, and a *koude markt*, which began in the middle of October and lasted six weeks. Both the "early" and "cold" fairs were much frequented by English merchants, who occupied the stores in a street still called *Engelsche Straat*. The "early" fair in 1749 thus lasted from April 25 to May 16, and, as the Frankfurt fair ended on April 21, there was plenty of time to visit the former.

A Supposed Visit to Lisbon, 1481 or 1483.

From June 8, 1479, the date of the interesting letter which we have thus largely quoted, up to March 1, 1483, on which day Martin Behaim appeared before a magistrate at Nuremberg to answer a charge of having danced on Ember day at a Jewish wedding, we know absolutely nothing about his movements. Most probably he resided during the whole of that time at Antwerp, occasionally visiting the Frankfurt fair and his friends at Nuremberg. Dr. S. Günther,⁵ however, and Dr. S. Ruge,⁶ suppose him to have paid during that time a flying visit to Lisbon. The former supposes that visit to have been paid in 1483. At Lisbon he might thus have heard about the efforts which were being made to improve the art of navigation, and having mentioned incidentally that as a pupil of the famous Regiomontanus he had some knowledge of astronomical observations, was summoned before the king and invited to join a *Junta dos Mathematicos*. Behaim, Dr. Günther supposes, then returned to Antwerp, wound up his business, came back to Lisbon, entered the Portuguese service, and was appointed cosmographer of Cão's expedition.

Dr. Ruge suggests that he visited Lisbon in 1481, and came to Nuremberg for the purpose of procuring astronomical instruments.

It need hardly be added that all this is mere conjecture. As to the *Junta* I shall have to say more in a following chapter.

A Dance at a Jew's Wedding.

After this digression let us return to Nuremberg and the 1st of March, 1483; when Martin Behaim, Hans Imhof and three others were charged with having been present at a Jew's wedding on Ember day (February 26). Martin Behaim and Sebald Deichsler, having actually danced at that wedding—a heinous offence, as it was Lent—were condemned to a week's imprisonment; the others escaped with a reprimand. The sentence, in the case of Behaim, was allowed to stand over until his return from an intended visit to the fair at Frankfurt.⁷ History doth not tell whether the culprit ever returned to Nuremberg to undergo his punishment.

Departure from Antwerp, 1484.

We next meet with Martin Behaim in October or November, 1483, at the "cold" fair at Bergen,⁸ when Hamran Gross, on behalf of Nicolas Schlewitzer of

⁵ Günther, 'Martin Behaim,' p. 12.

⁶ Petermann's Mitteilungen, 1890, Litt. No. 1,680.

⁷ For the legal documents referring to this case see Appendix, p. 110. The Frankfurt fair began on March 19.

⁸ The incidents referred to in what follows are detailed in a legal document drawn up at Nuremberg in February, 1489, and published by Dr. Günther ('Martin Behaim,' p. 53-54). The bonds given by Behaim to Leonhard Hirschvogel and Nicolas Schlewitzer on May 4, 1484, are

Nuremberg, lent him 50 Andreas gulden.¹ In addition to this he acknowledges to have received from Schlewitzer 5 rosaries, worth 1½ gulden Rhenish, 2 golden rings, as also a piece of gold lace, worth 1 gulden, all of which he was to have sold on commission. Schlewitzer had moreover paid for him at Nuremberg half a gulden for wax candles.

Altogether he owed to this creditor 58 gulden 3 ort, and as he was about to proceed to foreign parts he promised to pay this debt on his return, and provided that, in case of his death, it should be paid by his executors, heirs or assigns. By a second bond, drawn up in favour of his uncle, Leonhard Hirschvogel, he acknowledged to have received 9 sacks of galls,² weighing at Antwerp 31 cwts, to be sold by him, and promises payment as in the case of Schlewitzer. These bonds were dated May 3, 1484.

Martin Behaim then left Antwerp for Portugal, and as his creditors heard no more from him they applied to his brother Stephan for payment, and on February 13, 1489 they were paid the sums claimed; namely, Hirschvogel 110 gulden Rhenish currency for his galls, and Schlewitzer 58 gulden 3 ort, as stated above.

I publish in the Appendix all the letters still available which Martin Behaim wrote up to the time he left Antwerp for Portugal. They are homely letters, dealing with family affairs and commercial matters, but it would be vain to look for any indication that their writer took the slightest interest in science, literature or art. Among the merchandise incidentally referred to neither books nor scientific instruments find a place.³

V. BEHAIM IN PORTUGAL.

It was thus at the earliest in June, 1484, that Martin Behaim first came to Lisbon, for the suggestion that he paid a flying visit to that city in 1481 or 1482 is not supported by a scrap of evidence.

Nor do I think we do Behaim an injustice if we assume that the main, if not the sole, object of this journey was of a commercial nature.⁴ Commercial relations

embodied in it. It is a verbose document, such as would delight the heart of an English lawyer (see Appendix VI.). I have consulted the original at Nuremberg and corrected a few misprints in Günther's copy. XXI. should be XXIc (2100 or 21 cwts.); andrisser, which has puzzled commentators, andrisz guld (Andres gulden).

¹ The Andreas gulden were struck in 1470 by Charles the Bold of Burgundy, whose patron saint was St. Andrew; their value was about 10 shillings.

² Galls were tumours produced by the punctures of insects on several species of oak-trees. They were used as a medicine, and for the purpose of dyeing and making ink. The Syrian galls, which were imported by way of Venice, were valued most highly.

³ For a facsimile of the letter dated Mechlin, October 13, 1477, (Appendix II.) see Plate, p. 108.

⁴ J. F. Roth, 'Geschichte des nürnberg. Handels' (Leipzig, 1800), says that Behaim's father already had commercial relations with Portugal, but fails to give us documentary evidence in proof of this assertion.

between Portugal, on the one hand, and Flanders, the Hanse towns and several cities of Upper Germany, on the other, had long since been established. Portugal in exchange for wine, oils, honey, wax, leather and fruit received cloth, various manufactured goods and corn; the Portuguese had their national *bursa* at Brügge since 1373, and Royal "factors" or Consuls resided at that city and at Antwerp.⁵

Germans at Lisbon.

At Lisbon Behaim in the course of time was soon to meet many of his own countrymen and even townsmen, and these included not only merchants, but also printers and "bombardiers" in the Royal service.⁶ It was, however, only until several years after Behaim's arrival in Portugal that the houses of Imhof or Incurio, Hirschvogel and Hochstetter of Nuremberg established agencies at Lisbon, and jointly with Fugger and Welser of Augsburg chartered three vessels which sailed on a voyage to India with Francisco de Almeida's fleet in 1505.⁷ Accounts of this voyage were written by Balthasar Sprenger of Vils in the Tyrol,⁸ and Hans Mayr, whose narrative is included among documents collected by Valentin Ferdinand the printer.⁹ Members of the families of Imhof and Holzschuher appear to have resided at Lisbon at various times. A Paulus Imhof died there, after many years' residence, in 1507; a Wolfgang Holzschuher was knighted by King Manuel in 1503, for having valiantly fought against the Moors; a Jacob Holzschuher died at Lisbon in 1504; and a Peter Holzschuher died on a voyage to India in 1504. Wolf Behaim, the youngest brother of Martin, came to Lisbon as agent or partner of these Hirschvogels, his kinsmen, and died there on March 20, 1507, only four months before his brother. Another Nuremberger, Hans Stromer, who had accompanied the Markgraf Johann Albrecht of Brandenburg to the Holy Land, in 1485, died at Lisbon in 1490. Among other Germans who resided in Portugal, and who must have known Behaim personally or by reputation, were Lucas Rem and Simon Seitz, or Sayes, both of Augsburg. The former acted as representative of the Welsers in 1503, the latter came to Lisbon in 1503 and remained there until 1510, keeping all the while a diary,¹⁰ in which Behaim is not once referred to. The printer, Valentin Ferdinand, has already been mentioned. He acted as interpreter to

⁵ Reiffenberg, 'Relations anciens de la Belgique et du Portugal' ('Nouv. mém. de l'Ac. de Bruges,' XIV., p. 25).

⁶ J. G. Biedermann, 'Geschlechterregister' (Bamberg, 1748), Kunstm., 'Die Deutschen in Portugal' (Suppl. 'Allgem. Zeitung,' October 25, 1847).

⁷ The German merchants risked 36,000 ducats in this venture.

⁸ 'Die meerfart unn erfahrung nürwer schiffung, 1509,' of which a facs. reprint was published at Strassburg in 1902, with a critical essay by J. H. F. Schulze.

⁹ 'Bol. Soc. Geogr.,' Lisbon, XVII., 1901, p. 355.

¹⁰ B. Greiff published this diary in the '26 Jahresbericht des hist. Kreisvereins in Schwaben, 1861.'

Dr. Monetarius of Nuremberg in 1494,¹ and there is no doubt whatever that he knew Behaim. Yet, in his accounts of Portuguese discoveries no hint is to be found that Behaim took the slightest share in them. The silence of his German contemporaries may partly be due to the fact that Behaim lived most of the time in Fayal, with his father-in-law. This, however, does not explain the silence of Valentin Ferdinand, nor of Lucas Rem, who was at Lisbon when his fellow-countryman died in hospital.

German Brotherhoods.

Not only were German residents numerous at Lisbon in Behaim's day, but there also existed two German Brotherhoods.² The more ancient of these was the "Irmandade" or "Confraria de S. Bartholomeu dos Allemãos em Lisbon." It originated towards the end of the thirteenth century when one Overstädt or Sobrevilla, a German merchant, built a chapel near the Tajo. King Diniz, finding its site suitable for a larger building, erected upon it the Church of St. Julião, which was completed in 1290, and a chapel within this church—the fourth on the south side—was allotted to the "Brotherhood." The church was ruined by the earthquake, and burnt down in 1816, but it was rebuilt after each disaster. The "Brotherhood" retains its chapel within it to the present time, and a mass is still said there on Sundays and holidays for the soul of its founder. The German bombardiers who served in the Royal Navy, and who were granted special privileges in 1489, belonged to this Brotherhood and were nursed in its hospital.³

The second Brotherhood originated in 1414 among Burgundians and Flemings who took part in the siege of Ceuta, and who are described, in 1482, when King John confirmed their ancient privileges, as the "Confrades alemães e flamengos da Confraria de Sta. Cruz e Sto. André."⁴ They had their chapel in the ancient church of a Dominican monastery, founded in 1249, near the Rocio. This Brotherhood is credited with having looked carefully after brethren in distress and seen to their decent burial. The "Hospital de todos os Santos," founded by King John in 1492, stood in the garden of this monastery.⁵ It was in this hospital that Behaim died.

¹ See p. 2.

² J. D. Hirsch, 'Hanseatische Geschichtsblätter,' XVIII., p. 27. J. von Minutoli, 'Portugal u. seine Kolonien' (Berlin, 1855), I., 337; private letter of H. Daehnhardt, German Consul General at Lisbon.

³ In 1870 the "Statutes" of the Brotherhood were amended. Germans up to the fourth generation are now admitted as "brethren" without distinction of religion. A Protestant chapel was built in 1807 on the site of its old hospital.

⁴ Luis de Sousa, 'Historia de S. Domingos,' 3rd. ed. (Lisbon, 1866), I., 399. An English Brotherhood founded in 1147 by comrades who helped in the capture of Lisbon from the Moors, had its Chapel of St. George in the same church. Up to 1249 it owned a chapel in the Igreja dos Martens (Martyres).

⁵ Ruy de Pina, c. 56; Resende, c. 140.

Martin Behaim's Private Life

We know very little of the life led by Behaim at Lisbon. There is no doubt, however, that at an early period he made the acquaintance of Josse van Hurter, the Captain donatory of Fayal and Pico, whose daughter Joanna de Macedo became his wife.⁶ This connection no doubt gained him admission to the Court and to Society, even though his personal claims as the eldest son of a German patrician might not have done so. Commercial pursuits, at that early period at all events, do not appear to have been a bar to such admission, whatever may have been the case subsequently, when Portugal had become debauched by an inflow of wealth from India, and the honest trader was looked down upon with contempt.⁷ It is, however, possible that Behaim, on making this aristocratic connection, gave up commerce, took up his residence in Fayal, and assisted his father-in-law in the management of his estate.

But whatever his occupation, there were rumours set afloat that Behaim's conduct was not that of an honourable man. Thus, his brother Wolf, writing from Lyons to his cousin Michael, on November 27, 1491, says: "Here at Lyons they say things about Martin which make me ashamed of him, and I wish very much we were rid of him altogether."⁸ There may have been a foundation for these rumours current among commercial men at Lyons. Martin may have been guilty of "irregularities" in matters of business, which in the eyes of business men are looked upon as heinous offences, although treated with some indulgence by men of the world. We can hardly believe his conduct to have been "dishonourable," or his father-in-law, only a few years afterwards, would not have intrusted him with the collection of money owing for sugar sold into Flanders.

Still, it is rather curious that Dr. Monetarius, who had evidently been on friendly terms with Behaim during the visit of the latter to Nuremberg in 1490-93 (for he gave him a letter in which he advised the King to employ him on a voyage of discovery), and who was the guest of Behaim's mother-in-law, when he visited Lisbon in 1494, should not have stated in the 'Itinerarium' which he wrote of his travels that his young townsman was absent from Lisbon at the time of his visit, or referred to him in any other way whatsoever. Perhaps he thought "De amicis nil nisi bonum."

⁶ This happened in 1488, or earlier, for a son was born to him on April 6, 1489. For a full account of these relations see the chapter on "Fayal and the Azores."

⁷ See Jorg Pock's letter, dated Lisbon, March 27, 1520 (Ghillany, p. 118). Jorg (or George) Pock was the Lisbon agent of the Hirschvogels of Nuremberg. He came to Lisbon long after Behaim's death, and all he knew about him was from hearsay. In 1520 he went out to India, and on January 1, 1521 he wrote from Cochín: "I have read with pleasure the news about the monk of Wittenberg (Luther), have told it to all the priests, who marvel much, and say that he preaches the truth, and a bishop here says that this monk is a holy man in the sight of God."

⁸ Ghillany, p. 105.

VI. THE JUNTA DOS MATHEMATICOS.

Advisory Committees.

KING JOHN II. is known, on several occasions, to have referred questions of a scientific or technical nature to men of learning who enjoyed his confidence and who he believed would wisely advise him. He did so when Columbus urged him to send an expedition across the Ocean Sea in search of Cypangu and the East Indies.¹ On that occasion the members of this *Junta*—to employ a designation used not quite logically in connection with such ephemeral committees—were Dr. Diego Ortiz de Vilhegas, a native of Calzadinha in Leon, who had come to Portugal in 1476, as spiritual director of that “most excellent lady,” D. Joanna, and stood high in the Royal favour²; Dr. Rodrigo de Pedras negras, the chief physician of the King, with whom his influence was considerable, as we learn from the ‘*Epistola*’ of Cataldo de Aquila, printed at Lisbon in 1500; and Master Josepe or José, a Jew, who is undoubtedly identical with José Vizinho, a pupil of the famous astronomer Rabbi Abraham ben Samuel Zacut of Salamanca, Professor of Astronomy and Mathematics in the University of his native town, until 1492, when with thousands of his co-religionists he fled Spain, and found a refuge in Portugal, where King John appointed him Astronomer Royal.³ This Rabbi Abraham is the author of an ‘*Almanach perpetuum Celestium moduum ejus radix est 1473*,’ a work originally written in Hebrew, but translated into Latin by José Vizinho ‘*discipulum ejus*,’ and printed at Leiria in 1496.

A few years afterwards D. Diogo Ortiz, Dr. Rodrigo and a Jew, Moyses, were instructed to prepare a map for the guidance of João Pero de Covilhã and Afonso de Paiva, whom the King was about to dispatch in search of the country of Prester John.⁴

It is, however, another ‘*Junta dos mathematicos*’ which more especially interests us. This *Junta* was appointed in 1484 or at latest in 1485. Its task was to lay down simple rules for determining the latitude from meridian altitudes of the sun, for the pole star, which had served for that purpose in the past, was no longer available once the Portuguese navigators had crossed the Equator.

¹ Barros, ‘*Da Asia*,’ Dec. I., liv. III., c. 11.

² He became in succession Bishop of Tanger (1491), Ceuta (1500), and Vizeu (1505), and as Grand Chaplain stood at the deathbed of King John, together with Dr. Rodrigo. He died in 1519 (Paiva Manso, ‘*Historia ecclesiastica*,’ Lisbon, 1872, I., pp. 49, 62; Resende, c. 213).

³ On June 9, 1493, he was paid 10 golden espadins (about £7 10s.) by order of King John, and signed the receipt in Hebrew characters, not being permitted, as a Jew, to make use of the letters of Holy Writ (Souza Viterbo, ‘*Trabalhos nauticos*,’ I., 326).

⁴ F. Alvarez, ‘*Verdadeira informação*,’ c. 103; Castanheda, ‘*Historia*,’ liv. I., c. 1. Father Alvarez was the chaplain and historian of a Portuguese mission to Abyssinia, 1520–7. A translation of his narrative by Lord Stanley of Alderley was published by the Hakluyt Society in 1881.

João de Barros and the ‘Junta.’

We are indebted to the famous historian João de Barros⁵ for an account of this *Junta*. He mentions Behaim as a member of it, and to him alone all later historians—including G. P. Maffei,⁶ Petrus Matthaeus (1590), Olfert Dapper,⁷ A. Cordeiro, S.J. (1641), and Manoel Telles da Silva (1689)⁸—are indebted for this information, and there is thus no accumulative evidence as suggested by several of Behaim’s biographers.

J. de Barros (who wrote in 1539), having informed his readers that when Vasco da Gama reached the Bay of St. Helena he set up his large wooden astrolabe on land, as he had been unable to obtain trustworthy meridian altitudes of the sun on the deck of an unsteady vessel, either with that instrument or with some of the smaller astrolabes of brass with which he had been supplied, and having asserted that the Portuguese mariners were the first to employ these altitudes for the determination of latitude, continues as follows:—

“At the time when Prince Henry began the exploration of Guinea the mariners sailed within sight of the coast, being guided by landmarks which they described in sailing directions, such as are still in some way in use at present, and this sufficed for this mode of exploration. But subsequently, when, in the pursuit of their discoveries, they lost sight of the land and penetrated the open sea, they found that owing to currents and other secrets of the sea their estimate of a day’s work was frequently erroneous, whilst an observation of the altitude (of the sun) would have shown correctly the distance run. And as necessity is the mistress of all arts, King John II. referred this matter to Master Rodrigo and Master Josepe, a Jew, and both his physicians, and to one Martin of Bohemia, a native of that country, who boasted of being a disciple of John of Monte Regio, famed among the students of the science of astronomy. These discovered this manner of navigating by altitudes of the sun, and made tables of its declination, such as are now in use among navigators, and which are now more exact than in the beginning, when these large wooden astrolabes were in use.”

A statement made by so distinguished an author is entitled to respect and deserves careful examination. Still, I may be forgiven for directing attention to the fact that even in the days of Prince Henry the Portuguese were not afraid to venture upon the high sea, for they sailed to the Azores, lying 600 sea miles from the nearest land. Long before them the hardy Northmen, guided solely by the stars and the flight of birds, had found their way across the northern Atlantic, and Columbus would

⁵ ‘*Da Asia*,’ Dec. I., liv. iv., c. 2.

⁶ G. P. Maffei, S.J., was born at Bergamo in 1536 and died at Lisbon, 1603.

⁷ Olfert Dapper published a number of geographical compilations of value between 1667 and 1688. He died (at Amsterdam) 1690.

⁸ ‘*De rebus gestis Joanni II.*,’ Lisbon, 1689. Telles da Silva, Marquis de Alegrete, died 1709.

have made his famous landfall equally well had he trusted entirely to his dead reckoning or, like a bird of passage, to his instinct, for his observed latitudes are woefully out.¹ Verily, the Portuguese seamen of that age were better observers than their Spanish rivals!

The last paragraph in the account given by J. de Barros seems to refer to improved tables of the sun's declination. Dr. Breusing² suggests, however, that the author refers to an instrument which superseded the astrolabe for taking a meridian altitude of the sun on ship-board, and that this instrument was the cross-staff. I shall deal fully with this new aid to navigation, and merely observe in this place that the cross-staff was known in Portugal when J. de Barros wrote, in 1539, but that it was not made use of by Vasco da Gama, Magellan or any other seamen of the period with which I deal.

Of the three persons named by J. de Barros as members of the *Junta*, two, namely Dr. Rodrigo and Josepe or José, have already been referred to, whilst the third, Martin Behaim, shall be dealt with fully a little further on.

The Astronomical Expedition of José Vizinho, 1485.

Josepe or José Vizinho seems to have taken the lead in the work done by this *Junta*. He was no mere theorist, for we learn from a note inscribed by Christopher Columbus on a margin of the 'Historia Papae Pii' (Venice, 1477) that in 1485 he was sent to the Guinea coast for the express purpose of determining a number of latitudes by observing meridian altitudes of the sun. This note reads as follows:³

"In the year 1485 the King of Portugal sent Master Jhosepius, his physician and astrologer, to determine the altitudes of the sun throughout Guinea, all of which he performed; and he reported to said most serene king, I being present, that . . . on March 11,⁴ he found that the island of idols near Sierra Leone was exactly 5 degrees distant from the Equator, and he attended to this with the utmost diligence. Afterwards said most serene king often sent to Guinea and other places . . . and he always found the results to accord with said Martin Josepius, whereby I have the certainty that the Castle of the Mine is under the Equator."

¹ He places his landfall (Guanahani), by dead reckoning in 28° N., the north coast of Cuba, by observation, in 42° N., the true latitudes being 24° and 23°! On the chart of Juan de la Cosa, his pilot, Trinidad lies in latitude 14° N., Guadalupe in 21° N., Guanahani in 35° N., and the north coast of Cuba in 36° N., the true latitudes being respectively 10°, 16°, 24° and 23° N. On the chart of Bartolomeo Columbus, published by Wiesner, the errors are even more considerable.

² 'Zeitschr. f. Erdkunde,' IV., 1869, p. 403.

³ 'Raccolta Colombiana,' P. I., T. III. Serie B, No. 363. Simon de la Rosa y Lopez, 'Catalogo,' p. xxxiii., believes that this note is by Bartholomew Columbus.

⁴ Dr. Scheppegg suggests to me that there ought to be a full stop after March 11, and that this was the date on which José made his report.

In another marginal note⁵ Columbus states that he himself during various voyages to Guinea had taken altitudes of the sun with the quadrant and other instruments, and that his results agreed with those of Master Yosepius and of others whom the king had sent out. Columbus, in comparing the distances obtained by dead reckoning with those corrected by observations for latitude made by himself and others, concludes that El-Ferghani was right when he gave the earth a circumference of 20,400 miles, and reckoned 56½ miles to a degree of the Equator.

These marginal notes were evidently written long after the events recorded, and Columbus may have made a mistake in recording José's latitudes, just as he made a mistake when he tells us in another marginal note that the latitude of the Cape of Good Hope, as determined by B. Dias, was 45° S.⁶ Perhaps the 5 degrees refer to the Castella S. Jorge da Mina, for the Ilhas dos Idolos (Los islands) lie in 9° 30' N. That Columbus himself should have made such a mistake is not surprising, for he was a very incompetent observer, but that José, a learned astronomer, should have brought home so erroneous a record is incredible. Still it is well known that latitudes taken on board ship frequently differed to the extent of several degrees from the truth, and on Soligo's Chart of Portuguese Guinea, which I shall deal with fully in the second part of this work, we read off the mouth of the Niger "hic non apar polus," although that locality lies more than six degrees to the north of the Equator.

Summing up, we find that the *Junta*, and more especially its most active member, José Vizinho, advised that vessels sailing beyond the Equator should observe meridian altitudes of the sun for finding the latitude, that experimental voyages were undertaken to test this method, and Zacut's 'Almanach perpetuum' was translated and printed in order to facilitate the calculation of the observations made. These reforms led naturally to the adoption of graduated sailing charts, which had previously been unknown in Portugal.

Behaim as an Astronomer.

In what way, it may be asked, could Martin Behaim aid Dr. Rodrigo and José Vizinho in the task they had undertaken? He was no seaman, for at that time he had crossed the sea but once, and that as a passenger, on a voyage from Antwerp to Lisbon. He may have boasted of being a pupil of Regiomontanus, and may have been admitted, as a lad, to the observatory of that great astronomer; but it is quite certain that he profited little or nothing from lessons he may have received on these occasions.⁷ In his letters, as far as they have reached us,

⁵ Imago mundi of Pierre d'Ailly ('Raccolta,' L. C., Serie C., No. 490).

⁶ See my paper on 'the Voyages of Diogo Cão and Bartholomew Dias' ('Geogr. Journal,' Dec. 1900).

⁷ See p. 7.

there is no allusion to his ever having taken an interest in astronomical work; among the articles he dealt with as a merchant there are no astronomical or other scientific instruments. Columbus, in his numerous marginal notes, never once mentions his name. The only contemporary to hint at Martin Behaim's qualifications as a seaman or astronomer is Hieronymus Monetarius in a letter addressed to King John in 1493.¹ In that letter he recommended Behaim as being "well fitted" to accompany an expedition for "disclosing the East to the West." Monetarius, however, is hardly a competent witness on such a question. An examination of the famous globe of Nuremberg enables us to form a more trustworthy estimate of Behaim's capacity. We there find that he placed the mouth of the Congo in lat. 24° S., and the Montenegro in lat. 38° S., the true latitudes of these localities being 6° 4' and 15° 40' S. This proves conclusively that if Behaim accompanied the famous expedition of Cão as cosmographer or astronomer, as is maintained by his biographers, he was absolutely ignorant of the work he had undertaken. On the other hand, if this portion of his globe is merely a compilation, he exhibited a deplorable incapacity as a compiler, for since Dias' return in 1488, the latitudes along the African coast, as far as the Cape, were approximately known.

Moreover, several legends on the globe prove Behaim's ignorance as a "cosmographer." Thus we read, in 78° N., "the longest day here lasts six months," and in the gulf of Guinea, within the tropics, the curious reader is told that it is summer there when we in "Europe have winter," a statement quite appropriate to the southern temperate zone, and possibly taken over from some old map, and put in the wrong place. Another legend proves Behaim's absolute ignorance in matters connected with the art of navigation, for it tells us with reference to the Indian Ocean:—

"Here the *Stella maris*, by us called *Polus Arcticus*, cannot be seen, and those who navigate this sea must sail (shape their course) with the help of the *astrolabe*, for the compass does not point (to the north)."

No doubt such nonsense was believed at one time by the ignorant,² but no seaman, nay, no observant landsman who had once crossed the Equator, as Behaim claims to have done, could have penned such a sentence.

It is not likely that a man so inexperienced as was Behaim at that time, at all events, could have taught anything to a man of the scientific attainments of Mestre José. He may have boasted at Lisbon of being a pupil of Regiomontanus, and, on the strength of this boast, may have been invited to join a *Junta* of astronomers; but his want of knowledge would soon have betrayed itself. Yet, in spite of these considerations, some of his more imaginative biographers have credited him with achieve-

ments which would entitle him to a foremost position among the scientific men of his age. J. F. von Bielefeld,³ copying a statement in that untrustworthy 'Dictionnaire' of Louis Moréri,⁴ suggests that "Behaim was the first to apply the compass to the navigation of the high sea, an achievement, if true, deserving of immortality."

Antonio Ribeiro dos Santos, the author of a 'Memoria sobre alguns mathematicos Portuguezas,'⁵ actually adopts these wild statements. He says with reference to Behaim: "He was a disciple of the famous mathematician John de Monte Regio, Professor of Astronomy, who devoted himself with much diligence to the study of cosmography and navigation. He entered the service of Portugal and was well received by Kings Affonso V.⁶ and John II. on account of the nobility of his person, his attention to his profession and discourses. The last-named Prince, on February 18, 1485, appointed him one of his esquires (*escudeiros*), and the navigation of the Portuguese derived much profit from him. Of him it is said that he was the first to adapt the compass for the general use of navigators, which would suffice to immortalize his name and confer much honour upon Germany, his fatherland."

A. Ziegler,⁷ in 'Regiomontanus ein geistiger Vorläufer des Columbus' (Dresden, 1874, p. 17), speaks of Behaim as "one of the most learned mathematicians and astronomers of his century, a famous navigator and Portuguese cosmographer," and in a paper published in the 'Deutsche geographische Blätter' (Bremen, 1878, p. 117), he actually suggests that Behaim was the *spiritus familiaris* of Ruy Faleiro,⁸ to whom he revealed the secrets of cosmography and new methods for determining the longitude.

Quite as fantastic is the statement put forth by a more recent writer, J. P. de Oliveira Martins ('Les explorations des Portugaises,' Paris, 1893, p. 20), who would have us believe that John II., "when he ascended the throne and founded at Lisbon a school of mathematics, summoned from Nuremberg a pupil of Regiomontanus, Martin Behaim, upon whom devolved the rôle formerly filled at Sagres⁹ by Jacomé of Majorca."

¹ 'Progrès des Allemands dans la science' (Amst., 1752), pp. 72-76.

² Moréri was born at Bagemont (Provence) in 1643, and died in 1680. His 'Dictionnaire' was first published in 1678. This first edition does not refer to Behaim: Bielefeld quotes one of the many enlarged subsequent editions, probably that of 1732.

³ 'Mem. da litt. Port.,' VIII. (Lisbon, 1812), 20th ed. 1856, p. 164.

⁴ Affonso V. died 1481!

⁵ A. Ziegler was born at Ruhla in 1822, and died at Wiesbaden in 1887. He was a great traveller.

⁶ Ruy Faleiro was a native of Covilhã, joined Magellan in Spain in 1517, and died about 1529 at Seville. Herrera (Dec. II., lib. 2, c. 19) first started the story of a "demonio familiar," but does not identify him with Behaim. Humboldt ('Krit. Unters.,' I., 234) suggests that this Ruy or Rodrigo Faleiro was the Dr. Rodrigo of the Junta, but the latter is described as a native of Pedras negras, and not of Covilhã.

⁷ On the supposed Academy of Sagres see De Souza Holstein, 'A escola de Sagres' (Lisbon, 1877), and J. Mees, 'Henri le Navigateur et l'école de Sagres' ('Bull. de l'Ac. Belgique,' Classe des Lettres, 1901).

¹ See Appendix IX.

² S. Günther, 'Johannes Kepler und der Tellurisch-kosmische Magnetismus' (Vienna, 1888).

I must leave it to the sound judgment of my readers in how far extravagant claims, such as these, can be reconciled with what we know of Behaim and of the history of Portugal in the time of John II.

The Astrolabe.

Far less fanciful are those authors who merely credit the *Junta* with having "invented" the astrolabe or "adapted" it to the use of navigators. One of the earliest among the former is Manuel Pimentel (*'Arte de Navegar,'* Lisbon, 1682), whose lead was followed by Admiral Ignacio da Costa Quintella (*'Annaes da Marinha Portugueza,'* Lisbon, 1889, I, 190). Thus the *Junta* might merely have simplified the planispheric astrolabe of the astrologers, so as to adapt it to the use of seamen. This planispheric astrolabe, of which numerous examples may be seen at the British Museum,¹ had a shallow well—the mater astrolabii—within which was placed an engraved chart of the heavens as seen in a given latitude, on a stereographic projection. An ingeniously devised Reta or Arenæa (Spider's Web) moved concentrically



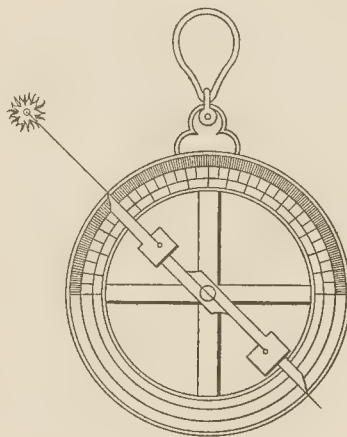
THE ASTROLABE OF REGIOMONTANUS, 1468.

above this chart, and by means of it certain astronomical problems could be solved graphically. The improvement by Regiomontanus merely consisted in a device which rendered the instrument more useful to astrologers desirous of finding the "initia coelestium domiciliorum," a device of no interest whatever to the seaman.²

¹ One of its earliest descriptions is by Hermann Contractus of Vehrigen, a pupil of the Convent School of Reichenau, who wrote *'De mensura astrolabii.'* The author died in 1054.

² Breusing, *'Die nautischen Instrumente,'* Bremen, 1890, p. 3.

The seaman's astrolabe,³ as shown in the illustration, was a much more simple instrument. A disc or a ring of wood or metal, 8 to 15 inches in diameter, was crossed by lines representing the horizon and zenith. The rim between the horizon and zenith was divided into 90 degrees. A movable rule or alidade, with sights, turned



THE SEAMAN'S ASTROLABE.

round a point or pin in the centre of the circle. The observer sat with his back to the main mast, held the astrolabe in suspension on a finger of his left hand, whilst he moved the rule up and down with his right until the sun was on with both sights. Supposing the astrolabe had been suspended vertically, this yielded a correct, though somewhat rough, altitude of the sun. Of course, on deck a rolling vessel, the results obtained even by a skilled observer were frequently far from satisfactory, and Master John, one of the pilots of Cabral's fleet, tells us that errors of four or five degrees in the resulting latitude were almost unavoidable.⁴ Hence, when it was desired to obtain trustworthy results, the observer landed and set up an astrolabe of larger dimensions upon a tripod stand. This was done by Vasco da Gama when he arrived at the Bay of St. Helena.

Murr⁵ was the first to connect Behaim with the introduction or adaptation of the astrolabe for the service of the Portuguese marine, and his view was accepted by Francisco de Borja Garção-Stockler,⁶

³ Abulwefa, a famous Arab astronomer of the ninth century, clearly describes this simple instrument (L. A. Sédillot, *'Mém. sur les instruments astronomiques des Arabes,'* Paris, 1841, p. 195).

⁴ *'Alguns documentos,'* p. 122.

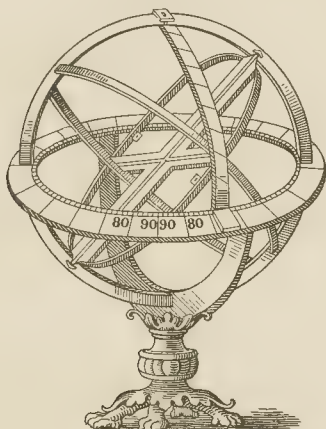
⁵ *'Dipl. Geschichte Martin Behaims' (Gotha, 1778); 2nd edition, 1801, p. 72.*

⁶ *'Ensaio hist. sobre a origem e progresso das mathematicas em Portugal' (Paris, 1819).*

Humboldt,¹ Rudolf Wolf,² and others. It is, however, stated by Manuel Telles da Silva, Marques de Alegrete,³ that the astrolabe was made use of for the first time by Diogo d'Azambuja in 1481, that is, several years before Behaim arrived in Portugal.⁴

The Meteoroscope.

Sebastião Francisco de Mendo Trigozo⁵ suggests that Behaim merely made known in Portugal certain instruments made in Nuremberg, and the 'Ephemerides' of Regiomontanus. Among the instruments he mentions the meteoroscope of Regiomontanus, an adaptation of a



THE METEOSCOPE.

similar instrument devised by Ptolemy, and described in a letter to the learned Greek Cardinal Bessarion.⁶ Martin Cortes,⁷ the son of the famous conqueror of Mexico, explains how this instrument enables an observer to determine the latitude and time by extra-meridian altitudes of the sun. The "hemisphère nautique" invented in 1581 by Michal Cagnet of Antwerp, and described by G. Fournier,⁸ is in reality nothing more than

¹ 'Krit. Unters.' (Berlin, 1874), p. 234, where he suggests that "Behaim's astrolabe, which was hung up to the mast (!), was perhaps only a simplified adaptation of the meteoroscope of Regiomontanus."

² 'Geschichte der Astronomie' (Munich, 1877), p. 100.

³ 'De rebus gestis Joanni II.' (Lisbon, 1689), p. 152.

⁴ Diogo d'Azambuja was born in 1432 at Montemor, and died there in 1518, having done valiant service in Africa and Asia. He was leader of the expedition which built the Castella de S. Jorge da Mina (1481-4) (L. Cordeiro, 'Diogo d'Azambuja,' Lisbon, 1892).

⁵ 'Memoria sobre Martin de Bohemia' ('Mem. de litt. portug.,' VIII., Lisbon, 1812, seg. ed., 1856, p. 371).

⁶ Published by Schoener (Ingolstadt, 1533). Apianus, 'Instrumentbuch' (Ingolstadt, 1533), and Ghillany, p. 39.

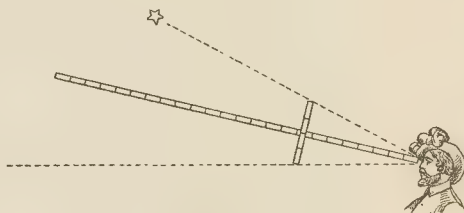
⁷ 'Breve compendio de la Sphera' (Seville, 1556, III., c. 11).

⁸ 'Hydrographie' (Paris, 1643), liv. X., cc. 17, 18.

the upper half of the meteoroscope. Fournier, a very good judge, looks upon this instrument as being absolutely useless on board ship, as its orientation depended upon a knowledge of the variation of the needle when making an observation.

The Cross-Staff.

Dr. A. Breusing,⁹ director of the "Seefahrtsschule" of Bremen, was the first to suggest that the instrument made known to the Portuguese by Behaim, was the cross-staff, and Dr. S. Günther¹⁰ agrees with him. The earliest description of this instrument is by Levi ben Gerson, a learned Jew of Bañolas in Catalonia, and was dedicated to Pope Clemens VI. in 1342.¹¹ Levi calls his instrument "baculus Jacob," George Purbach,¹² "virga visoria," and Regiomontanus, "radius astronomicus." The last has frequently been credited with its invention, but J. Petz has shown that he was acquainted with Levi's description of it.¹³ Pedro Nunes,¹⁴ the famous Portuguese astronomer, quotes Regiomontanus when describing the baculus or radius astronomicus. Among Portuguese and Spanish seamen it became known as balestilha, among Frenchmen



THE CROSS-STAFF.

as arbalète, in England as cross-staff.¹⁵ It is a very simple contrivance for observing stellar distances and the altitudes of heavenly bodies. Our illustration sufficiently shows its appearance and the manner of its use. It merely

⁹ 'Zeitschrift d. Ges. f. Erdkunde,' IV. (Berlin, 1869).

¹⁰ 'Martin Behaim' (Bamberg, 1890), pp. 25, 63, and Eneström's 'Bibl. mathem.,' new series, IV., p. 77.

¹¹ Levi ben Gerson died at Perpignan in 1370. His MS. is at Munich (cod. lat. Mon., 8089). Its contents were first made known by S. Günther.

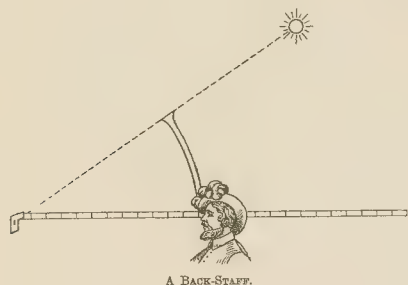
¹² This famous astronomer was born at Peuerbach (Austria) in 1423. He died 1462 as Professor of Mathematics at Vienna. Johan de Monte-regio, or Regiomontanus, was his pupil.

¹³ 'Mitt. des Ver. f. d. Geschichte Nürnberg's,' VII., p. 123.

¹⁴ 'De arte atque ratione navigandi' (Coimbra, 1546), lib. I., c. 6, which was originally printed as an appendix to a 'Tratado da esphera' (Lisbon, 1537), or 'De regulis et instrumentis' ('Opera mathematica,' Basel, 1566, p. 73).

¹⁵ Dr. Bittner ('The Mohit of Admiral Sidi Ali ben Hosein, 1554,' Vienna, 1867) suggests that "balestilha" may be derived from the Arabic "al balista," altitude, and not from the Latin "balista." On the instrument used by the India pilots for taking the altitudes of stars, see Barros, 'Da Asia,' Dec. I., lib. IV., c. 6, and my 'Vasco da Gama,' p. 27.

consisted of a staff along which a "transom" could be shifted at right angles. Divisions of equal length were marked along staff and transom. An observer desirous of obtaining the altitude of a star, placed one end of the staff against his right eye and then shifted the transom until its lower end touched the horizon and the upper end hit the star. Nunes, however, points out that owing to the indefiniteness of the horizon at sea, the results could not be trusted. The instrument was useless for taking the altitude of the sun, unless the eye was protected by a coloured glass or the sun was visible only dimly behind a screen of vapour. It became practically available only after John Davis had converted it into a back-staff,¹ which enabled the seaman to take his observations with his back turned to the sun.



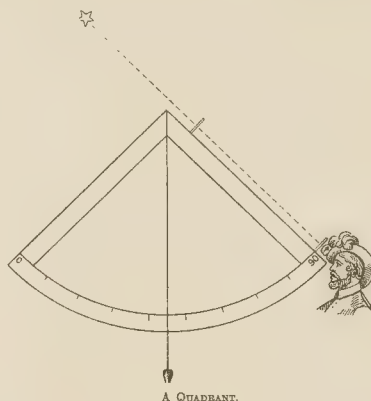
When Nunes' essay was published, in 1537, the cross-staff had been placed in the hands of mariners, but in Behaim's days it was unknown to them. Columbus, Vasco da Gama, Cabral, Duarte Pacheco Pereira made use of the astrolabe and quadrant, but never mention a cross-staff. A. Vespucci, when appointed Piloto mayor in 1508,² was instructed to examine the pilots in the use of the two instruments named. Under these circumstances we are bound to disbelieve that Behaim made known the cross-staff to the Portuguese seamen.

The Quadrant.

There are, of course, a few other instruments which a merchant coming from Nuremberg might have introduced to the notice of Portuguese astronomers, such as metal quadrants, and sundials.

The quadrant had been in use among Portuguese seamen long before the arrival of Behaim among them, for Diogo Gomez tells us that in 1456 he made use of it

in observing the altitude of the Pole Star.³ Our illustration shows how it is used, and needs no further explanation. In at least one respect this simple instrument was superior to the astrolabe, for it enabled the observer to determine



the altitude of the sun when seen looming through fog or thin clouds, which could be only done with the astrolabe when the luminary shone brightly.

The Nocturnal.

The nocturnal or horometer, an instrument for ascertaining the hours of the night by observing the Pole Star and its so-called guardians, was already known to P. Apianus. P. Nunes thought little of this instrument, and it does not seem that it was ever used on board ship.⁴

Sundials.

In the letter which Dr. Monetarius wrote to King John of Portugal in 1494 he mentions the "quadrant, cylinder and astrolabe" as instruments likely to guide Behaim and other mariners in a proposed voyage across the western ocean. I have dealt already with the quadrant and the astrolabe. As to the "cylinder," it is nothing but one of those portable sundials for the manufacture of which Nuremberg and other German cities were famous in the fifteenth and sixteenth centuries. The "cylinder," of which Sebastian Münster⁵ gives an illustrated description,

³ 'De prima inventione Guinea' ('Abh. bayr. Ak. d. Wiss., Hist. A., 1845).

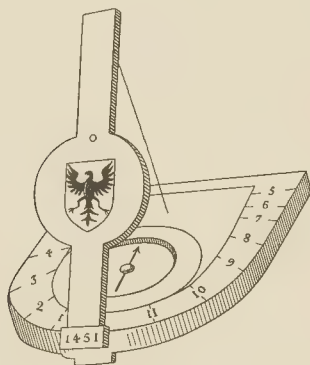
⁴ For illustrated descriptions of the nocturnal see G. Fournier, 'Hydrographie,' liv. X., c. 20, and A. Schück, 'Das Horometer,' in 'Mitt. d. Geogr. Ges. in München,' I, 1905, p. 269.

⁵ 'Compositio horologiorum' (Bas., 1531), c. 39. S. Münster, the famous author of a 'Cosmographia,' of which 24 editions in German alone were published in the course of a century, was born at Ingelheim in 1489, and died at Basel in 1552.

¹ Described in 'The Seaman's Secrets' (London, 1607), and 'The Voyages and Works of J. Davis,' edited for the Hakluyt Society by Admiral Sir A. Markham (London, 1880). This famed navigator was a native of Sandridge in Devonshire. He was killed in 1605 in a fight with Japanese.

² 'Navarrete Coleccion,' III., Dec. 7-9.

resembled a miniature post-office pillar-box about 70 mm. in height, from the top of which a gnomon or "index" extended horizontally. There were other kinds of "horologii viatorum" or travellers' dials, vulgarly known as "compasses." They were combinations of a horizontal string sundial with a compass. One of the most ancient of these instruments may be seen in the museum at Innsbruck. It is dated 1451, bears upon its shield-shaped lid the German eagle, and was probably



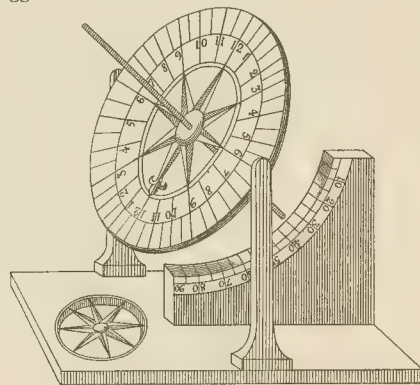
A HORIZONTAL STRING SUNDIAL, 1451.

made for the Emperor Frederick III.¹ A similar dial, dated 1453, from the Spitzer Collection, is now in the British Museum. The arms of Habsburg are engraved upon its shield, and with the exception of the style of ornamentation both instruments are alike. The dial-plane measures 78 by 59 mm. and holds a compass. On lifting the shield-shaped lid, a string, serving as gnomon, is drawn up. Usually, however, these string dials were made in the shape of a square box, as described in the 'Cosmographicus Liber' of P. Apianus (Landshut, 1528).

But whilst horizontal dials or "compasses" served only in the latitude for which they were made, an equinoctial dial, that is, one whose dial-plane is parallel to the equinoctial plane with a stylus or gnomon rising perpendicularly from its centre, could easily be converted into a universal dial, adjustable to any latitude. The manner in which this was done is shown in our illustration. Such an instrument might have proved of real service to the

¹ For a full description of this and of other ancient sundials, see A. Volkenhauer, 'Mitt. d. geogr. Ges. in München,' I., 1905, p. 251. These compasses were no doubt made at Vienna, where Purbach wrote his 'Compositio compassi cum regula ad omnia climata.' At Nuremberg the compass-makers were incorporated in 1510, but Dr. Mummenhof, on searching the 'Bürgerbuch,' discovered the names of two masters of the craft in the list of citizens for 1481. But Regiomontanus, the pupil of Purbach, is known to have made sundials years before at Nuremberg (H. Wagner, 'Nachr. d. K. Ges. der Wiss. zu Göttingen,' philosoph. hist. Klasse, 1901, Heft. 2).

mariner, especially as it would have enabled him likewise to determine the variation of the compass-needle, and even the latitude (by measuring the length of the shadow cast by the gnomon), but I am not aware of its ever having been introduced on ship-board in Behaim's day. Magellan, many years afterwards, was content to carry hour-glasses, similar to those which still survive in many kitchens, where they regulate the time for boiling an egg.²



A UNIVERSAL EQUINOCTIAL SUNDIAL ADJUSTED TO LAT. 36° S.

Of course, it is quite possible that Martin Behaim imported into Portugal portable sundials, small metal astrolabes and other instruments for which his native town was famous, just as his brother Wolf, about ten years afterwards, imported "Nuremberg eggs" or portable wheel watches, which had only recently been invented.³

The Ephemerides.

Martin Behaim has been credited not only with having introduced into Portugal certain astronomical instruments, but also with having made known there the 'Ephemerides' of Johann Müller of Königsberg, known as Regiomontanus. These famous 'Ephemerides ab anno 1475 ad annua 1506' were published at Nuremberg ten years before Behaim came to Portugal, and were reprinted at Venice in 1483. Is it likely that King John, who took such a lively interest in scientific pursuits, and his advisers, should have remained ignorant of the existence of a work of such importance? But even supposing that these 'Ephemerides' had first become known in Portugal

² P. Nunes ('Opera,' Bas. I., p. 123) says that sundials were rare on board ship.

³ Schlagurlein—striking watches—are mentioned among the articles left behind by Wolf when he died in 1507. They were to have been sold, but up to 1518 no money realised by the sale had been received (Letter of Michael Behaim to Jorg Pock, Gillany, p. 112). These famous wheel-watches were invented early in the sixteenth century at Nuremberg by Peter Hele of Strassburg (d. 1540).

through the agency of Behaim, they would not have attracted any special attention. José Vizinho, the most active scientific adviser of King John and of his successor King Manuel, knew, as a matter of course, that the 'Almanach' of Zacuto, his former teacher, contained tables which would enable an observer to compute readily his latitudes from an observation of the meridian altitude of the sun, which was not possible as long as only the 'Tables' of King Alfonso¹ of Castile were available. This 'Almanach perpetuum celestium motuum,' having been translated by José Vizinho from Hebrew into Latin, was first printed at Leiria in 1496, but there is no doubt that MS. copies, especially of the few tables of special interest to mariners, existed long before that time.² The 'Almanach' contains four "tabulae solis" for a cycle of four years (1473-6), including three ordinary and one leap-year, and a "Tabula declinationis solis ab equinoctiali." The former give the sun's geocentric longitude for each of the twelve signs of the Zodiac and for each day of each year, whilst the latter gives the sun's declination corresponding to these longitudes. This declination table differs but slightly from a similar table included in the work of King Alfonso. With the help of Zacuto's tables a latitude would be computed as follows:—

April 10, 1473. Meridian altitude of the sun,	50°
observer south of the sun	
Sun's longitude in the sign of the Ram (Tabula solis)	29° 38'
Corresponding declination	11° 24' N.
	0
	50 0
	90 0
Zenith distance	40 0 S.
Declination	11 24 N.
Latitude	28 36 S.

It is credibly reported that Zacuto instructed the pilots who sailed in his time on voyages of discovery,³ and there can be no doubt that his 'Almanach' was in use in the Fleets of Vasco da Gama, Cabral, João de Nova and Albuquerque.⁴ Of course, they may have been

supplied as well with the 'Ephemerides' of Regiomontanus, and we know that Columbus and Vespucci made use of the work of the great German astronomer. Andres de San Martin, one of the pilots in Magellan's fleet, who was killed in Sebu in 1521, had both the 'Almanach' of Zacuto and the 'Ephemerides,' and found both woefully in error when attempting to calculate a longitude from a conjunction of Jupiter and the moon, which he had observed on December 17, 1519.⁵

Francisco Albo, another pilot of Magellan's expedition, who was fortunate enough to return to Spain, to judge from the log-book as published by Navarrete (IV., 1837, p. 209), evidently had tables of declination of our modern type.⁶ These tables are entered with the date, and furnish the sun's declination at a glance, without the computer being obliged to have recourse to a "Tabula Solis" giving the sun's geocentric longitude. Eugen Gelcich⁷ surmises that "tables were prepared in this form at the suggestion of Behaim and of his colleagues of the Junta, in order to meet the requirements of mariners." José Vizinho might, of course, have prepared such tables, and so might any ordinary pilot, for their computation called for little skill and no knowledge of astronomy. But I demur even to the suggestion that Behaim, whose ignorance of nautical matters I believe to have been proved, had a share in this humble work.

The earliest printed tables of this kind I found in Martin Fernandez de Enciso's 'Suma de Geographia' (Seville, 1519). These tables, like all those of a subsequent date, are calculated for a cycle of three ordinary and one leap year, as in Zacuto's 'Almanach.' Two sets of similar tables are found in a MS. Codex now in the library of the Duke of Palmella, and published at his expense.⁸ This codex contains a treatise on the mariner's compass by João de Lisboa,⁹ dated 1514, besides a number of other papers and documents by unknown authors dating from the end of the fifteenth to the middle of the sixteenth century. Among these are two sets of declination tables, the one of the usual type, the other peculiar, inasmuch as the point of reference for what its author called "declination" is the North Pole. Thus decl. 28° S. is expressed by 90° + 23° = 113°, whilst decl. 28° N. is given as 90° - 23° = 67°. Neither date nor author of these two sets of tables is given. The last set of tables which need be mentioned are printed in Pedro de Medina's 'Arte de Navegar' (Valladolid, 1545).

The fact that these various tables were computed

¹ These 'Tables' were calculated by two Jewish astronomers, 1262-1272, but only printed at Augsburg in 1488.

² I consulted the first edition at the Bibliothèque de Ste. Geneviève at Paris. Other editions, amended and enlarged, were printed at Venice (1498, 1499, 1500 and 1502). The 'Ephemerides sive Almanach perpetuum,' edited by Johan Lucilius Santritter of Heilbronn, and printed by P. Lichtenstein at Venice in 1498, are described by R. Wolf ('Geschichte der Astronomie,' p. 97) as the work of Regiomontanus, when in reality they are by Zacuto, of whose existence he seems to have been unaware.

³ Gaspar Correa, 'Lendas da India,' I. (Lisbon 1855), pp. 10, 16, 23, 261-4, 375. Correa went out to India in 1512 and died there before 1583. His 'Lendas' deal with the history of India up to 1550. They were partly written in 1561 and are of varying trustworthiness.

⁴ Vasco da Gama sailed for India in 1497 and 1502, Cabral in 1500, João da Nova in 1501, Afonso de Albuquerque in 1503.

⁵ Herrera, Dec. II., lib. IV., c. 10.

⁶ The tables quoted by him differ from those of Enciso to the extent of one to three minutes.

⁷ 'Die Instr. u. d. wissenschaft. Hilfsmittel der Nautik' (Hamburg, Festschrift, 1892), p. 90.

⁸ 'Livro de Marinharia, cop. e coordenado por Jacinto Ignaccio de Brito Rebello' (Lisbon, 1903).

⁹ João de Lisboa accompanied Tristão da Cunha to India in 1506, was appointed Piloto mór in 1525, and died in 1526.

independently is made manifest by the following table, which gives the southern declination for the first of January of each of the four years of a cycle.

January 1 (Old Style).	Encheo, 1519.	Livro de Marinharia.		Pedro de Medina, 1545.	M. Pimental, Arte de Navegar, 1585.	Recent Tables (1825-97)
		1st Set.	2nd Set.			
1st year	21 54	21 52	21 48	21 51	21 54	21 53
2nd "	21 55	21 54	21 50	21 54	21 56	21 55
3rd "	21 58	21 57	21 52	21 56	21 58	21 57
4th "	22 00	21 58	21 54	21 58	22 00	22 00

*Breusing, Günther and Ruge on Behaim's services
on the Junta.*

It is now time to ask what, in the opinion of competent critics, had Behaim done to entitle him to a position on a scientific committee which J. de Barros assigns to him, or the appointment as cosmographer and astronomer of the important expedition which left Portugal in 1485 under the leadership of Diogo Cão?

Dr. A. Breusing,¹ Director of the School of Navigation at Bremen, who lays stress upon the importance of improved instruments of observation, contents himself with suggesting that Behaim made known in Portugal the cross-staff and a metal astrolabe of handier size than those which he supposes to have been in use up to his time.

Dr. S. Günther² suggests that Behaim paid a visit to Lisbon in 1482 or 1483, that he there heard of the efforts which were being made to improve the art of pilotage, whereupon he let it be known in the course of conversation, that he, as a pupil of the great astronomer Regiomontanus, had acquired knowledge likely to prove of great service to mariners. The King, when he learnt this, invited the young stranger to join the Junta dos mathematicos, which had recently been appointed. Behaim, as a matter of course, accepted this invitation, and thus secured a position in Portugal. He then returned to Germany, to wind up his affairs, went back to Portugal in 1484, and was at once appointed to accompany an expedition for the exploration of South Africa. Günther then maintains that the introduction of the cross-staff and of the 'Ephemerides' most amply justified the Portuguese mathematicians in inviting this youthful stranger to join in their deliberations.

Dr. Sophus Ruge, in a review of Günther's excellent biography,³ accepts the view that Behaim paid a flying visit to Lisbon in 1482, where he boasted of having studied astronomy under Regiomontanus, and was commissioned in consequence to procure certain astronomical

instruments, including a cross-staff, for which his native Nuremberg was famous. With that object he visited Nuremberg in 1488, was taught there the use of these instruments, and although never appointed a member of the Junta, his technical advice proved of such value that it secured him the appointment as astronomer of Cão's expedition.

All this is most ingenious, no doubt, but it is mere conjecture. He might have paid a visit to Lisbon in 1482, for nothing is known of his movements between June 9, 1479, when he was at Antwerp, and February, 1483, when he was summoned before the magistrates at Nuremberg for having danced at a Jew's wedding. Instead of returning immediately to Lisbon with his instruments, he attended the Easter fair at Frankfurt, and the fair at Bergen in October or November, where he bought cloth and borrowed money, and was only ready on May 4, 1484, to leave Antwerp for "foreign parts."⁴ The documents still available mention cloth, galls, and a few other articles as the merchandise he dealt in, but refer in no single instance to "instruments." Had he been commissioned to buy instruments at Nuremberg, as conjectured by Dr. Ruge, he would no doubt have returned immediately to his mandatories. At the same time it is curious that a supposed pupil of Regiomontanus should have been obliged to visit Nuremberg in order to make himself acquainted with the use of instruments invented or manufactured by his master. Still, it is just possible that Behaim did import instruments into Portugal, but there is absolutely no proof extant that he ever did so.

VII. BEHAIM'S AFRICAN VOYAGE, 1484-85.

It is to an alleged voyage with Diogo Cão, either as astronomer or, as he himself asserts, as captain of one of the two vessels of the expedition, that Behaim owes the title of *Navarchus*, *Seefahrer*, or *Navigator*. Behaim himself has given two versions of this voyage, but before placing these before the reader I shall sketch the progress of Portuguese discovery along the west coast of Africa up to the year 1490.⁵

Portuguese Voyages of Discoveries, 1472-82.

When John II. in 1481 ascended the throne of his father Affonso, the Guinea coast had been explored as far

⁴ See Chapter IV., p. 9.

⁵ For a fuller account of these explorations see my essay on 'The Voyage of Diogo Cão and Bartholomew Dias' ('Geographical Journal,' Dec. 1900). Since writing this paper important rock inscriptions referring to Cão's second expedition have been discovered at the mouth of the river Mposso, near Matadi.

¹ 'Zeitschr. d. Ges. f. Erdkunde,' Berlin, 1869, p. 105.

² 'Martin Behaim' (Bamberg, 1890, pp. 13, 25).

³ Petermann's Mitteilungen, 1890, Lit. No. 1,680.

as Cape S. Catherine. Lopo Gonçalves had been the first to cross the line; Fernão Pó is credited with having discovered in 1372 the Ilha formosa, which now bears his name; whilst Ruy de Sequeira "about the same time," according to Galvão,¹ followed the coast as far as Cabo de S. Catharina (November 25), and also discovered the islands of S. Thomé (December 21) and S. Antonio (January 17). The latter subsequently became known as Ilha do Principe, that is, the island of Prince John, the future King John II., who had enjoyed the revenues of the Guinea trade ever since 1473. This trade had become of importance, but nothing had been done to expand it since 1475, in which year the monopoly granted to Fernão Gomez came to an end, nor had steps been taken to render effective the claims to sovereignty put forth by Portugal. Hence foreign interlopers made their appearance upon the coast, and during the unfortunate wars with Castile (1475-80) entire fleets sailed from Spanish ports to share² in the profits of the trade there.

One of the first measures taken by King John was to put a stop to these irregularities. Royal ships were sent out to protect Portuguese interests, and on January 20, 1482, Diogo D'Azambuja laid the foundations of the famous Castella de S. Jorge da Mina, which was the first permanent European settlement on the Gold Coast, and the centre of Portuguese activity up to 1637, when it was captured by the Dutch.

King John, having thus attended to what he conceived to be his more immediate duty as a king and ruler, took up the long-neglected work of his uncle Henry the Navigator, for, as Ruy de Pina tells us, he was not only "a good Catholic, anxious for the propagation of the faith, but also a man of an inquiring mind, desirous of investigating the secrets of nature."³

Diogo Cão's First Voyage of Discovery, 1482-84.

The King appointed Diogo Cão to the command of the first expedition despatched from Portugal to take up the exploration of the African coast beyond the Cabo de S. Catharina. Cão left Lisbon about June 1482, called at S. Jorge da Mina for supplies, and then followed the coast until a body of fresh water, five leagues out at sea, revealed the existence of a mighty river (rio poderoso) which had poured it forth. This river was the Congo. He there entered into friendly relations with the natives, and having

despatched messengers with gifts to the king of the country, and set up a stone pillar at the river's mouth, he continued his voyage to the south. When he reached the Cabo do lobo, in 13° 26' S., now known as Cape St. Mary, he erected his second pillar or padrao.⁴ This pillar, fortunately, has been recovered intact. An inscription upon it, in Portuguese, tells us that in the year 6681 of the world or in that of 1482 since the birth of Christ the King ordered this land to be discovered by his esquire



THE ARMS OF PORTUGAL, 1484.



THE ARMS OF PORTUGAL SINCE 1485.

(escudeiro) Diogo Cão. The coat of arms is that in use up to 1485, when King John ordered the green cross of the order of Aviz to be removed from it, the number of castles to be reduced to seven, and the position of the "quinas," or five escutcheons, to be changed.⁵

When Cão came back to the Congo he was annoyed to find that his messengers had not yet returned, and being naturally anxious to hasten home with a report of his important discovery, he seized four native visitors to his ship as hostages. He gave their friends to understand that they should be brought back in the course of time to be exchanged for his own men who were still with the king.

Cão came back to Lisbon in the beginning of 1484, and certainly before April of that year, for on the 8th of that month he was granted an annuity "in consideration of his services," and a few days afterwards was given a coat of arms charged with the two padrões he had erected on the coast of Africa.

Diogo Cão's Second Voyage of Discovery, 1485-86.

Cão's departure on his second expedition was delayed until the latter part of 1485, and the padrões which he took with him were ornamented with the new coat of arms, recently adopted and dated 1485 A.D. and 6185 of the creation, the latter year beginning with September 1,

¹ Antonio Galvão was born at Lisbon in 1503, spent 1527-47 in India, and died 1557 in hospital. His 'Tratado' was published at Lisbon in 1563, and again, with a translation, by the Hakluyt Society, ('The Discoveries of the World'), 1862.

² D. Cão, in 1483, captured three Spanish vessels on the Guinea coast. For an account of this capture by Eustache de la Fosse of Doornick, see C. Fernández Duro, 'Boletín,' Geographical Society of Madrid, 1897, pp. 193-5.

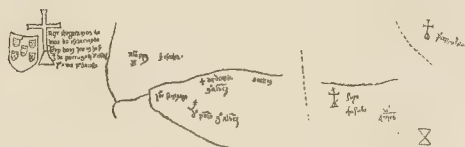
³ Ruy de Pina, 'Chronica d'El Rey João II.,' c. 57.

⁴ Illustrated descriptions of these padrões are given by Luciano Cordeiro, 'Boletim da Soc. Geogr. de Lisboa,' 1892 and 1895.

⁵ This change probably was ordered in June 1485 when a similar change took place in the coinage. (Teixeira de Aragão, 'Descr. geral e hist. das moedas,' Lisbon, 1874-83, I, p. 240; J. Pedro Ribeiro, 'Dissert. chronol. e críticas,' t. III. App. VI. and plates.)

1485.¹ It seems that Cão, on this occasion, commanded three vessels, his fellow captains being Pero Annes and Pero da Costa. It is possible that Cão, when crossing the Gulf of Guinea, discovered the island called I. Martini on Behaim's Globe, and now known as Anno bom. Such a discovery is suggested by a rough map of an 'Ilha Diogo Cam' depicted upon a loose sheet in Valentin Ferdinand's MS. The shape of this island, however, resembles in no respect the two delineations of the island of Anna bom given in the same MS., and no reference to it is made in the text.

Cão on reaching the Congo ascended it for about ninety miles, as far as the River Mposo, above Matadi, and within sight of the Yelala Falls, for there, upon some rocks upon the right bank an inscription² has been discovered which records this achievement. The coat of arms proves that this inscription dates from 1485, or a subsequent year. We there read: "Thus far came the



INSCRIBED ROCKS NEAR MATADI.

vessels of the illustrious King D. João II. of Portugal: D^o Cão, P^o Annes, P^o da Costa"; further to the right, "Alv^o Pyrez, P^o Escolar"; lower down, "J^o de Santyago, ✱ of illness (da doença), J^o Alvez (Alvares), ✱ D^o Pinero, G^o Alvez—Antão." Still further away there is another cross with a few names—Ruys, Farubo, Annes, and a masonic symbol (Σ).

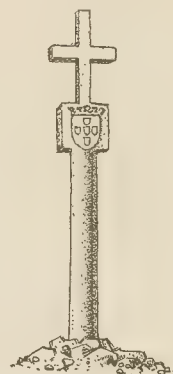
Several of the names given are those of well-known Portuguese seamen. A Pero Annes served under Albuquerque in India; Pero Escolar accompanied the Congo embassy in 1490-1, was pilot of one of Vasco da Gama's vessels, and accompanied Cabral to India; João de Santiago commanded the store vessel of the expedition of B. Dias.

The remaining names may have been cut into the rock subsequently to Cão's expedition of 1485. The name of *Martin de Bohemia* is looked for in vain.

¹ For a description of this padrao see Scheppig, 'Marine Rundschau,' 1894, p. 357, and 'Die Cão-Säule am Kap Cross' (Kiel, 1903): L. Cordeiro, 'O ultimo Padrao de Diogo Cão' (Boletim, 1895, p. 885).

² This important inscription was known in 1882, for on the map of the Lower Congo, by Capello and Ivens, is indicated a 'Padrao Portuguez.' Father Domenjuz of Matadi seems to have been the first to have taken a photograph of it, which was published by L. Frobenius in his work 'Im Schatten des Kongo Staates,' 1907. Another photograph, by the Rev. Petterson, has been published by the Rev. Tho. Lewis ('Geogr. Journal,' xxi, 1908, p. 501).

Cão, having landed the hostages whom he had carried



THE PADRAO OF CAPE CROSS.

off two years before, proceeded to the south. He kidnapped several natives, who were to be taught Portuguese so that they might serve as interpreters in future expeditions. On the face of 'Monte negro,' 15° 41' S., he erected a padrao, and a second at Cape Cross, described as Cabo do padrao and Sierra parda on old maps, in 21° 50'. The former of these pillars is now in the Museum of the Lisbon Geographical Society, its inscription quite illegible; that of Cape Cross was carried off by Captain Becker in 1893, and has found a last resting-place in the Museum of the 'Institut für Meereskunde' in Berlin. The German Emperor has since

caused an exact copy of it to be erected on the spot.

If we may trust to a legend upon a Map of the World drawn in 1489 by Henricus Martellus Germanus,³ a legend confirmed by a 'Parecer' drawn up by the Spanish pilots and astronomers who attended the 'Junta' of Badajoz in 1524,⁴ Diogo Cão died near this Cape Cross.

And if Cão died, the details given by Ruy de Pina and Barros of the final stage of this expedition—the interview with the Mani Congo, who asked for priests and artisans, and sent Cazuto with gifts of carved ivory and palm-cloth to Portugal as his ambassador—must be rejected. I am inclined to believe that these details refer to Bartholomew Dias. Cazuto would then have reached Portugal in December 1488, was baptized at Beja in January 1489, when the King, his Queen, and gentlemen of title acted as sponsors, and was sent back to Congo with D. Gonçalo de Sousa, King John's ambassador, in December 1490.

But whatever the circumstances, Cão's name disappears henceforth from the annals of Portugal. His ships returned, no doubt, in the course of 1486, and when Dias started on his memorable voyage in August 1487 he took back with him the natives kidnapped by Cão on the coast beyond the Congo.

The Voyage of Bartholomew Dias, 1487-88.

When an envoy of the King of Benin came to Portugal in 1485 or 1486 he roused the King's curiosity

³ For a reduced facsimile of this map see p. 67. For further information on this map, p. 66.

⁴ This 'Parecer' or Report is printed in Navarrete's 'Coleccion,' IV. (Madrid, 1837), p. 347. J. Codine, 'Découverte de la côte d'Afrique' (Bulletin de la Soc. de Géogr., 1876, Notes 23 and 29), would have us believe that the words "et hic moritur" of the legend do not refer to Cão but to the Serra Parda. This is quite inadmissible. The Spanish pilots say "donde murio" where he died.

by giving him an account of a powerful ruler, far inland, who held a position among the negroes not unlike that held by the Pope in the Christian world. The King hastily concluded that this Ogane, as he was called, could be no other than the long-sought Prester John. He at once sent messengers by way of Jerusalem and Egypt in search of him, and prepared an expedition to aim at the same goal by sailing round Africa. The command of this expedition was given to Bartholomew Dias de Novaes, who departed from Lisbon in July or August 1487. He followed the coast to the south, and before the year had closed arrived at a Cabo da Volta and a Serra Parda at the entrance of a capacious bay, originally called Golfo de S. Christovão, but since known as Angra Pequena and Lüderitz Bay. Here, in lat. 26° 38' S., he set up his first pillar, fragments of which may now be seen at Lisbon and in the Cape Town Museum.

Proceeding onward, Dias, for a time, ran along the coast, but before he reached St. Helena Bay he had lost sight of the land. He thus sailed as far as 45° S., and, having apparently weathered a storm, stood east, but failing in the course of several days to meet with land, turned his prow to the northward. Sailing in that direction for 150 leagues, he saw lofty mountains rising before him, and on February 8, 1488, the day of St. Braz, he came to anchor in a bay which he called Bahia dos Vaqueiros (Cowherd's Bay). It is the Mossel Bay of our days.

During his onward course Dias had to struggle against the Agulhas current, as also against the prevailing southeasterly winds, and his progress was slow. He entered the Bahia da Roca (Rock Bay), now known as Algoa Bay, and 30 miles beyond it on an inlet at the foot of a cape still known as Cape Padrone, he erected his second pillar, no trace of which has yet been discovered. When Dias reached the Rio de Infante (Great Fish River), and with it the threshold of the Indian Ocean, his crews refused to go any further. He turned back reluctantly, and on this homeward voyage he first beheld the mountains which fill Cape Peninsula, and at their foot set up his third and last padrão. According to tradition he named the southern extremity of this peninsula Cabo tormentoso, in memory of the storms which he had experienced, but King John, whose hope of reaching India by this route seemed on the eve of realization, re-named it Cabo da boa esperança—the Cape of Good Hope. We do not know whether Dias, on his homeward voyage, called at the Congo. We know, however, that he touched at the ilha do Príncipe, did some trade at a Rio do Resgate,¹ and called at S. Jorge da Mina. Ultimately, after an absence of sixteen months and seventeen days, he once more entered the Tagus. This was in December 1482.²

¹ 'Trade river'—perhaps the Rio formoso.

² Dias in 1497 accompanied Vasco da Gama as far as the Cape Verde Islands; in 1500 he commanded a vessel in Cabral's fleet, and perished off the Cape which he had discovered.

Minor Expeditions.

Voyages to the Guinea coast were of frequent occurrence at that time, and there is no reason why Behaim should not have been permitted to join one of these, either as a merchant or as a volunteer anxious to see something of the world. Most of these voyages were made for commercial purposes, but in addition to merchant-men there were Royal ships in the preventive service,³ and surveying vessels charged with a more minute examination of the coast and the inland waters than had been done by the pioneer explorers. One of the most famous of these surveyors was the heroic Duarte Pacheco Pereira, the author of the '*Esmeraldo de Situ orbis*.'⁴

We have particulars of only two expeditions of this kind. The first of these I have already noticed. It was accompanied by José Vizinho, the astronomer.⁵ The second was led by João Afonso d'Aveiro, who had been associated with Diogo d'Azambuja in the building of S. Jorge da Mina.⁶

João Afonso d'Aveiro and Benin, 1484-85.

The information concerning this voyage is fragmentary and leaves much to conjecture. J. A. d'Aveiro started in 1484, and he or his ship returned in the following year with an ambassador of the King of Benin, and the first Guinea pepper or pimento de rabo seen in Portugal, and sensational information about a king, Ogane, living far inland and rashly identified with the Prester John so long sought after. Upon receiving this news the King of Portugal ordered a factory to be established at Gato, the port of Benin, but the climate proved deadly to Europeans, many of the settlers fell victims to it,⁷ and the place was abandoned. King John, at the same time, sent Fr. Antonio of Lisbon and João de Montarroyo to the east to inquire into the whereabouts of Prester John,⁸ but, being ignorant of Arabic, they failed in their mission,

³ It was in this service that D. Cão, in 1480, captured three Spanish interlopers.

⁴ For a biographical notice see p. 2, Note 5.

⁵ See p. 13.

⁶ Ruy de Pina, c. 94, Garcia de Resende, and J. de Barros, '*Da Asia*, Dec. I., Liv. III., c. 3, say that d'Aveiro returned from this voyage in 1486; according to A. Galvão he returned in 1485 or 1486; according to Correa, '*Lendas*,' t. I., c. 1, in 1484. According to A. Manuel y Vasconcellos, '*Vida y acciones do Rey D. Juan II.*' (Madrid, 1626), p. 165, and Manuel Telles da Silva, '*De rebus et gestis Joanno*' (Lisbon, 1689), p. 215, both Cão and d'Aveiro sailed in 1484. These dates, unfortunately, are not very trustworthy.

⁷ There is no doubt that d'Aveiro died in Benin, but whether his death happened in the course of the first voyage or after the establishment of the factory at Gato, is not made clear from the available narratives of the voyage. J. Codine ('*Bull. de la Soc. de géographie*,' 1876) believes that he died during the first voyage.

⁸ De Barros, '*Asia*,' Dec. I., Liv. III., c. 5.

whereupon, on May 7, 1486,¹ he despatched João Pero de Covilhã and Afonso de Paiva on the same errand.

Behaim's Own Accounts of his Voyage.

Behaim has transmitted two accounts of the voyage along the west coast of Africa which he claims to have made, and on the strength of which posterity has dubbed him 'the Navigator.' The first and more ample of these accounts may be gathered from the legends of his Globe and the geographical features delineated upon it.

The second account has found a place in the 'Liber chronicorum,' compiled at the suggestion of Sebald Schreyer² by Dr. Hartmann Schedel,³ printed by Anton Koberger and published on July 12, 1493, on the eve of Behaim's departure from Nuremberg. The original MS. of this work, in Latin, still exists in the town library of Nuremberg, as also the MS. of a German translation which was completed on October 5, 1493, by George Alt, the town-clerk. The body of the Latin MS. is written in a stiff clerk's hand, and is evidently a clean copy made from the author's original. The paragraph referring to Behaim has been added in the margin, in a running hand. In the German translation, f. 285a, this paragraph is embodied in the text. This proves that this information was given to the editor after he had completed the Latin original of his work, but before George Alt had translated it. Behaim at that time was still at Nuremberg, and there can be no doubt that it was he who communicated to Dr. H. Schedel this interesting information, and is responsible for it.

The Story as told on the Globe.

I shall now give the Story of the Voyage as it may be gathered from the Globe. It is as follows:—

In 1484 King John of Portugal despatched two caravels on a voyage of discovery with orders to proceed

¹ Rui de Pina, who may have been present when these messengers took leave of the King, says May 7, 1486 (c. 21), but Alvarez (l.c. c. 102) was told by Covilhã, whom he met in Abyssinia in 1521, that he departed on May 7, 1487. If Covilhã left Portugal in May, 1486, d'Aveiro's expedition must have returned in 1485, and such seems to have been the case, for Frei Fernando de Soledade ('Historica Serafica da ordem de S. Francisco,' t. III., Lisbon, 1705, p. 412) says that Frei Antonio de Lisbon and João (Pedro) de Montarroyo were despatched in 1485.

² Sebald Schreyer, b. 1446, was a liberal supporter of art and science. It was at his suggestion that the 'Liber chronicorum' was compiled, and he paid part of the cost of its publication.

³ Dr. H. Schedel was born 1440, settled at Nuremberg in 1488 and died there in 1514. He was an enthusiastic pupil of Conrad Celtis, and an indefatigable collector of codices and inscriptions. On f. 286 of the Latin edition H. Schedel is named the author or editor, on June 4, 1493, but at the end of the volume, f. 300, his name is omitted, and the following are named instead:—Seb. Schreyer, Sebastian Kammermeister (mathematician), A. Koberger (printer), Michael Wolgemut and Wilhelm Pleydenwurff (draughtsman). M. Wolgemut, the famous artist, was born at Nuremberg in 1434, and the illustrations of the volume were executed in his workshop.

beyond the Columns of Hercules to the south and east. Of this expedition the author of the Globe was a member. The caravels were provisioned for three years. In addition to merchandise, for barter, they carried eighteen horses, with costly harness, as presents for Moorish (negro) kings, as also samples of spices which were to be shown to the natives.

The caravels left Lisbon, sailed past Madeira and through the Canaries. They exchanged presents and traded with Bur-Burum, and Bur-ba-Sin, Kings of the Jalof and Sin, on the north of the Gambia, stated to be 800 German miles⁴ from Portugal. Grains of Paradise were found in these kingdoms. Notice was taken of the current which beyond Cape Verde flows strongly to the south. The caravels then followed the coast to the east, past the Sierra Leoa (Sierra Leone), the Terra de Malagucta, the Castello de ouro (S. Jorge da Mina) and the Rio da lagoa (Lagos) to King Furfur's Country, "where grows the pepper discovered by the King of Portugal, 1485," and which is 1,200 leagues from Lisbon.⁵ "Far beyond this" a country producing cinnamon was discovered. The place names along this part of the coast, such as Rio de Bohemo (Behaim's river) are absolutely original, and are not to be found on any Portuguese chart. It is to be regretted that the original delineation of the bottom of the Bight of Biafra, including the island of Fernando Po, should have been destroyed, for what we now see is merely the work of a restorer.

The islands in the Gulf of Guinea—S. Thomé, do Principe and the Insule Martini—were "found" by this expedition, and they were then without inhabitants.

Sailing southward along the coast the explorers passed the "Rio do Padrão," a "rio poderoso" or "mighty river" (lat. 25° S.), distinguished by a flag placed on its northern bank, until they reached a Monte negro, in lat. 37° S., the extreme Cape of Africa, where they set up the columns of the King of Portugal on January 18, 1485.

Doubling this Cape the explorers sailed about 220 leagues to the east, as far as a Cabo ledo (lat. 40° S.) 2800 leagues from Portugal, and having set up another column they turned back, and at the expiration of 19 months⁶ they were once more with their King. A miniature of this cape shows the two caravels of the expedition. The distance from Portugal, as measured on the Globe, actually amounts to 2800 leagues.

The Story as told in the 'Liber chronicorum.'

I now proceed to give the story of Behaim's voyage as given in Schedel's 'Chronicle.' After a reference to

⁴ A gross exaggeration! From Lisbon to the Gambia is only 450 German miles, or, as measured on the Globe, 560 miles.

⁵ Of the identity of King Furfur's Country with Benin there can be no doubt. If we accept the date 1485 as correct, this country was discovered on the homeward voyage. Of course I know that "furfur" is the Latin for bran, and "fur" for thief or slave.

⁶ Nineteen months according to two legends on the Globe, one of them close to Cabo Ledo.

Prince Henry's discovery of Madeira and of the islands of St. George, Fayal and Pico, one of which was settled by "Germans of Flanders," the 'Chronicle' continues as follows:—¹

"In the year 1488² John II., King of Portugal, a man of lofty mind, despatched certain galleons (galeas), well found, on a voyage of discovery to the south, beyond the Columns of Hercules, to Ethiopia. He appointed two patrons (captains) over them, namely Jacobus³ canus, a Portuguese, and Martinus Bohemus, a German, a native of Nuremberg in Upper Germany, of good family, who had a thorough knowledge of the countries of the world and was most patient of the sea (situ terre peritissimum marisque patientissimum), and who had gained, by many years' navigation, a thorough knowledge beyond Ptolemy's longitudes to the west.⁴

"These two, by favour of the gods, sailed, not far from the coast, to the south, and having crossed the equinoctial line entered another world (alterum orbem) where looking to the east their shadow fell southwards, to the right.⁵ They had thus by their diligence, discovered another world (aliud orbem) hitherto not known to us, and for many years searched for in vain by the Genoese. Having thus pursued their voyage they came back after twenty-six months⁶ to Portugal, many having died owing to the heat. As evidence of their discovery they brought with them pepper, grains of paradise, and many other things, which it would take long to enumerate. A great quantity of this pepper was sent to Flanders, but not being shrivelled like the oriental pepper and of a longish shape, preference was given to the true pepper."

A Summary of the two Accounts.

These two accounts may be combined as follows:—

In 1484 two caravels, commanded by Diogo Cão and Martin Behaim, were despatched by King John. They traded with the Jalof and the people of the Gambia, and sailing east "found" the Guinea Islands, including the Insula Martini. Having crossed the Equator, a feat attempted in vain by the Genoese for many years, they discovered another world. Sailing south as far as 37°, they reached a Monte negro, the extreme Cape of Africa, where, on January 18, 1485, they set up a column. Doubling this cape they sailed east another 260 leagues,

as far as Cabo Ledo, when they turned back. King Furfur's Land, where grows the Portuguese pepper, seems to have been visited on the homeward journey in 1485. After an absence of 19 (26 or 16) months, they were once more at Lisbon, having suffered heavy losses from the great heat, and bringing with them grains of paradise, pepper and probably also cinnamon (said to have been discovered beyond King Furfur's Land) in proof of the discoveries they had made.

Behaim's account examined.

It is quite conceivable that Behaim's townsmen in the centre of Germany believed this account of his African voyage, but Behaim himself must have been aware that he was misleading them with a view to his own glorification. Even though he had made no voyage to the Guinea coast at all, and took no special interest in geographical exploration, he must have known that the islands of Fernando Pó, do Principe and St. Thomé, as well as the Guinea coast as far as the Cape of Catharina in latitude 1° 50' South,⁷ had been discovered in the lifetime of King Affonso, who died in 1481. Genoese, and also Flemings,⁸ certainly took a small share in the trade carried on along the coast discovered by the Portuguese, but since the days of Teodosio Doria and the brothers Vivaldi, in 1291, no Genoese vessels had started with a view of tracing the coast of Africa beyond the Equator. Behaim, if he really joined Cão in an expedition to Africa, must have known that his companion, in 1482, had discovered a mighty river and the powerful kingdom of the Mani Congo, and that in the course of a second expedition, in 1485, Cão traced the coast as far as a Cabo do Padrão, quite six degrees beyond the Monte negro of his globe. He must have known that Dias, in 1488, returned with the glorious news that he had doubled the southern cape of Africa, 12 degrees to the south of this padrão, and explored the coast for 120 leagues beyond, when the ocean highway to India lay open before him. Behaim is silent with reference to these facts, and any person examining his globe, and not conversant with them, would naturally conclude that it was Behaim, and his companion Cão, who first doubled the southern cape of Africa.

Grains of Paradise, Pepper and Cinnamon.

As to the grains of paradise, the pepper and also cinnamon, which were brought to Lisbon as "evidences" of discovery, a few words may be said.

Grains of Paradise, or Malaguetas, are the seeds of *Amomum granum Paradisi*, Afz, and as early as the

¹ Latin original, f.290; German translation, f.385a.

² A misprint for 1484 or 1485?

³ Jacobus, Diogo, James and Jack are synonymous.

⁴ This claim to be an experienced navigator is absurd, for Behaim's first experience of the sea was made in 1484. Of his further experience up to 1490, we know nothing.

⁵ The inhabitants of the tropical zone are, of course, Amphiscii, whose shadow at noon is thrown to the north or south according to the position of the sun. Behaim's statement is applicable only to inhabitants of the southern temperate zone.

⁶ In the Latin "vicesimo sexto mense," but in the German translation "in dem sechzehnten monat." Dias is said to have come back after an absence of 16 months 17 days.

⁷ Here, on the chart of "Ginea Portugalexe," 1484, is shown the "tree marking the furthest discovered in the time of Fernam Gomez," whose trading monopoly, granted in 1469, expired in 1474.

⁸ Pacheco Pereira, 'Esmeraldo,' p. 54, tells us of a ship manned by thirty-four Flemings, which was wrecked on the Malaguetta coast and its crew eaten up by the natives.

thirteenth century this condiment reached Barbary and Europe by caravans crossing the Sahara.¹ Their discovery on the coast of Guinea dates back to the days of Prince Henry.

The pepper of King Furfur's Land or Benin is the pimenta de rabo, or "tailed" pepper, which Portuguese historians tell us was first brought to Portugal by João Affonso d'Aveiro. It is the fruit of *Piper Clusii*, D.C. The discovery of this pepper caused a sensation, for pepper, up till then obtained from India by way of Venice, was a costly spice—"ter muita pimenta," pepper is dear, is still said proverbially. Unfortunately this Guinea pepper was not highly valued in Flanders. King John told Dr. Monetarius (*l. c.*, p. 68) that he believed the superiority of the pepper of Malabar and Sumatra to be due to the treatment of the berries, and that he had sent an expert to Cairo to enlighten him on the subject. After the discovery of India, when the trade in pepper became a Portuguese monopoly, the export of this pimenta de rabo was prohibited, in order that the high price of Oriental pepper might be maintained.²

Cinnamon is not found in Africa at all, except where its cultivation has been introduced in recent times from Ceylon. O. Dapper, however, the learned Dutch physician, apparently supports Behaim's statement as to cinnamon, for he says³ that "black cinnamon" is found in Loango and is used for the purpose of "divination" (probably in the poison ordeal). I have searched in vain for an authority for such a statement. Mr. R. C. Phillips and Mr. R. E. Dennett, both men of education and of inquiring minds, who resided for many years as merchants to the north of the Congo, know nothing about "black" cinnamon. Of course, there are several species of *Cassia*, such as the *Cassia occidentalis*, the bitter root of which is antifebrile, whilst the roasted seeds furnish the "Negro coffee" of the Gambia; *Cassia obovata*, which yields senna, and other species. The bark, a decoction of which is most generally in use in the poison ordeals, is furnished by the *Erythrophlaeum guineense*, Don., a tree found in all parts of Africa, from the Senegal to the Zambezi.⁴

*The Globe and contemporary Maps.*⁵

I now proceed to examine more closely the delineation of the west coast of Africa as given on the Globe, with special reference to the voyages of Cão, and of other expeditions of the period. I first of all compare the

longitudes of a few places as found on a map of "Ginea Portugalexe," in all probability drawn by Christopher Soligo of Venice, and on Behaim's Globe with what they really are according to modern observations. Soligo's map is contained in a codex, which originally belonged to a Count Cornaro-Piscopi, then found its way into the Palace of the Doges, and may now be consulted in the British Museum, where it is labelled Eg. 73. The codex contains 35 charts by various draughtsmen, or rather copyists. The chart of "Ginea Portugalexe" which concerns us is in three sheets, and depicts the entire coast from Portugal to the "Ultimo padrão" set up by Cão on Cape St. Mary in latitude 13° 16'. Its Portuguese original was evidently drawn immediately after Cão's return from his first voyage in 1484. The chart is furnished with a scale, but is still without parallels. A legend written right against the mouth of the Niger tells us "hic non apar polus," but this invisibility of the pole-star is not borne out by the scale of the chart, for if we place Lisbon, according to Ptolemy, in latitude 38° 40' N. and allow 75 miglie⁶ to a degree, the latitude of the mouth of the Niger would be 7° 30' N.

Localities.	Soligo, 1484.	Behaim, 1492.	Actual, 1907.
Lisbon	38 40 N.	40 0 N.	38 42 N.
Gambia	18 40 N.	11 0 N.	13 20 N.
Mina d'ouro (Elmina)	7 20 N.	4 0 N.	5 0 N.
Lagos	9 20 N.	4 30 N.	6 30 N.
Cabo formoso, Niger	7 30 N.	2 30 N.	4 20 N.
Rio do Padrão (Congo), Cão's First Pillar, 1482	6 0 S.	25 0 S.	6 0 S.
Cabo do lobo, Cão's second pillar dedicated to St. Augustin, 1492	18 0 S.	34 0 S.	18 26 S.
Monte negro, Cão's third pillar, 1495 . . . . .	..	38 0 S.	15 40 S.
Cabo do Padrão (Cape Cross), Cão's fourth pillar . . . . .	..	..	21 50 S.
Cape of Good Hope . . . . .	..	..	34 22 S.

The next table gives the distances between certain localities according to the same authorities and as measured on a rather rude map of the world by Henricus Martellus Germanus.⁷ This map is one of many in a manuscript codex, "Insularium illustratum," now in the British

⁶ The Portuguese Legoa of 7,500 varas was equal to 6,269 meters, and 4.24 Italian miglie of 1,480 meters each were therefore equal to one legoa. One degree of the Equator (111,307 meters) was consequently equal to 17.75 legoas or 75.21 miglie (or miles). Pilots generally assumed that 4 miles were equal to a league. Girolamo Sernigi, who wrote a letter to a gentleman at Florence about Vasco da Gama's first voyage, knew better, for he reckoned 4½ Italian miles to a league, and on the chart which Alberto Cantino caused to be compiled at Lisbon, in 1502, for his patron, Hercules d'Este, Duke of Ferrara, a degree is equal to 75 miglie (see Ravenstein, 'A Journal of the First Voyage of Vasco da Gama,' pp. 208, 245).

⁷ Henricus Martellus (Heinrich Hammer) was evidently a German settled in Italy. A MS. Ptolemy in the Biblioteca Magliabechiana contains a map of modern Italy drawn by him (A. Mori, 'Atti-sec. Congr. Ital.' Rome, 1896, p. 567). Facsimiles of his map of the world have been published by Count Lavradio (1863) and in Nordenfkiöld's 'Periplus.'

¹ Conde de Ficalho, 'Memoria sobre a Malagueta,' Lisbon (Academia das Sciencias), 1878.

² Conde de Ficalho, 'Plantas uteis da Africa Portuguesa' (Lisbon, 1884), p. 245.

³ O. Dapper, 'Africa' (German edition), Amsterdam, 1670, p. 511. Mr. Dennett is the author of 'Seven Years among the Fjort' (London, 1887) and 'Notes on the Folklore of the Fjort' (London, 1898).

⁴ Ficalho, 'Plantas uteis,' pp. 157, 164. Also Dr. M. Boehr, 'Corresponden. der Deutschen Afrik. Ges.,' vol. I., p. 382.

⁵ See Map of Guinea and South-Western Africa compiled from materials available in 1492. Map 5.

Museum (Add. MS. 15,760). It is dated 1489 and shows the discoveries up to the return of Dias in 1488. There is no scale, and in estimating the distances I have assumed the Mediterranean to be 3,000 Portolano miles in length.

Localities.	Soligo, 1484.	Martellus, 1489.	Behaim, 1489.	Actual, 1907.	Behaim's Errors.
Lisbon to the Gambia . . .	Leg. 460	Leg. 400	Leg. 680	Leg. 508	Per Cent. 24
Gambia to Lagos	470	480	470	420	12
Lagos to Cabo Formoso and the Rio de Behemo	70	70	100	55	95
Cabo Formoso to R. do Padrão, Congo	810	370	600	250	140
Congo to Cabo do Lobo . . .	120	110	210	128	64
Cabo do Lobo to Monte Negro .	..	80	70	44	59
Monte Negro to Cabo do Padrão	..	120	..	113	..
Cabo do Padrão to Cape of Good Hope . . . . .	..	360	..	280	..
Cape of Good Hope to Dias' furthest . . . . .	..	200	..	181	..
Total . . . . .	..	2,070	2,800*	1,879	..

* Inclusive of 220 leagues for the distance between Monte Negro and Cabo Ledo.

On examining the above tables it will be found that whilst along the Guinea coast, from the Gambia to the Cabo formoso (Niger), the latitudes differ from the truth to the extent of only about two degrees, and the excess in distances only amounts to 20 per cent., these errors rapidly increase as we follow the coast to the south. The island of S. Thomé,¹ the true latitude of which is 15° N., is placed by Behaim in lat. 7° 30' S, while the River Congo is placed 19°, the Monte negro 22° 20' beyond the true position; the distance as measured on the Globe exceeds the truth to the extent of over a hundred per cent.

Lower Guinea.

If we now turn to the delineation of South Africa on the Globe we cannot fail being struck with its general resemblance to the map of Henricus Martellus. It is only on comparing the nomenclature of the two that we discover striking differences. We then discover that the *Monte negro* which Behaim places in lat. 38° S. is not the Cavo de speranza of Martellus, as has been rashly supposed by certain critics,² but corresponds to the Monte negro of the latter, which we know to be in lat. 15° 40' S. It was upon this cape that Cão, in the course of his second voyage, erected one of his padrões, which has been discovered since *in situ*. We find further that the *cavo ledo* and *San bartholomeo viego* of the Globe, which seem to mark the furthest reached by Dias in 1487, are in reality

¹ St. Thomé 2° 30' N. according to Soligo, 1° N. according to Pacheco Pereira ('Esmeraldo,' p. 15).

² The "Caput bonæ spei" of Ghillany's and Jomard's facsimiles is not to be discovered on the Globe.

meant to represent the furthest reached by Behaim himself when he sailed in the company of Cão in 1485.³

The place names along the coast to the south of the Cabo de S. Catharina as far as the Monte negro agree, as a rule, with the names to be found on the few surviving charts of the age of the Globe. A few names are peculiar, but this is natural, as the small scale on which these maps are drawn made it impossible to introduce every name to be found on the original charts, and copyists or compilers did not agree in the selection they made. It is remarkable, however, that the name of the famous kingdom of Congo should be looked for in vain upon the Globe, although its discovery and the establishment of intercourse with its powerful ruler constituted the most important event of Cão's two voyages, and an embassy from him was staying in Portugal when Behaim left for Nuremberg. It is curious, too, that the flag at the mouth of the Rio do Padrão should fly from the north bank, when any visitor to the river must have known that Cão's padrao was erected to the south.

The Southern Extremity of Africa.

Once we have doubled the Cape of Monte negro the place names are as puzzling as the names inserted upon Juan de la Cosa's chart,⁴ which are supposed to represent the nomenclature bestowed by Vasco da Gama. Close to *Cabo Ledo* there is a *Rio do requiem*, which seems to owe its name to some tragedy, such as Cão's supposed death. Other names remind us of the voyage of Bartholomew Dias. A *Rio do Bethlehem* takes the place of Juan de la Cosa's Rio da Nazareth; the *Angra de Gatto* may represent the Angra das Vacas of the same author, for as Behaim writes "patron" instead of "padrao" he may fairly be supposed to have written "gatto" (cat) instead of "gado" (cattle); the "*Rio dos Montes*" reminds us of the "terra dos montes," the *Roca* of the "baia da Roca" (Algoa Bay) of Cantino's chart. Lastly there is the enigmatic "*San bartholomeo viego*" and an *Oceanus maris asperi meridionalis*, which has been supposed to be connected with the gales experienced by Bartholomew Dias when doubling the Cape of Good Hope.

Upper Guinea.

If we leave the South and direct our attention to Upper Guinea we shall find that, although the coast lines are drawn but roughly, there are not wanting indications that the author of the Globe had some personal knowledge of this part of Africa. He alone knows the name of the king from whose country pepper was brought to Portugal

³ See p. 24.

⁴ Juan de la Cosa accompanied Columbus and Alonso de Hojeda on their voyages to the West, 1493-1500, and on his return he compiled the map which bears his name, and facsimiles of which have been published by Santarem, Jomard, A. Vassano and in Nordenskiöld's 'Periplus.' J. de la Cosa was killed in a fight with Indians near Cartagena, 1509.

in 1485. "*King Furfur's Country*" is undoubtedly Benin, and if Behaim has placed the legend referring to it about a hundred leagues inland he did so only for want of space. Behaim, elsewhere, states that King Furfur's Country is at a distance of 1,200 leagues from Portugal, and this distance, measured on the Globe, carries us a hundred leagues beyond the *Rio do lagoa* (Lagos), as far as a *Rio de Behemo* (Behaim river), an appellation undoubtedly intended to point out the discoverer of the river, but absolutely ignored by all his contemporaries.¹ It is, however, more likely that merely new names were given to rivers previously discovered. For on Soligo's "*Guinea Portugalexe*" (1484) fourteen rivers are shown between the Rio dos Ramos and the Rio dos Camarões, including a Rio de S. Jorge and a Rio de S. Clara to the west of the Cabo Formoso, and a Rio de S. Bartholomeu immediately to the east of it.

The Guinea Islands.

The islands in the Gulf of Guinea, we are told, were "found" by the vessels which the King sent forth from Portugal in 1484, but they were actually discovered, with the possible exception of Annobom, during the reign of King Affonso, who died in 1481.

Fernando Pó, a cavalier of the household of that King, discovered, about 1471, the ilha formosa which now bears his name.

The ilhas de S. Thomé and S. Antão (Antonio) were perhaps discovered by Ruy de Sequeira, on his return from the Cabo de S. Catharina, the last discovery made during the reign of King Affonso.² The revenues of S. Antão having been granted to Prince João, the future King John II., when nineteen years of age (i.e. in 1474), the island was re-named Ilha do Principe, the Prince's Island, and under that name it figures on the Globe, as on all the available maps of the period.

The captaincy of S. Thomé was granted to João de Paiva on September 24, 1485, and its earliest colonists arrived there on December 16 of the same year. He was succeeded, in 1490, by João Pereira; in 1498 by Alvaro de Caminha, who sent thither the children of Jews who had been expelled from Spain in 1492,³ and "degradados" or convicts; and in 1498 by Fernão de Mello. King John, in a conversation with Dr. Monetarius, in 1494, spoke of this deportation, but Behaim, whose Globe was made in 1492, may refer to an earlier deportation consequent upon the cruel persecution of the Jews which, instigated by the Pope, took place in Portugal in 1487.⁴

¹ I fancy that this Rio de Behemo may be identical with the Rio Formoso, or river of Benin.

² The Saints' days are, St. Catherine, November 25, St. Thomas, December 21, St. Anthony, January 17.

³ King John received these fugitives on condition of their paying a ransom and departing the kingdom within a limited time, on pain of being made slaves.

⁴ Ruy de Pina, c. 29.

Insula Martini—Anno bom.

The *Insula Martini* of the Globe appears to have been named by Behaim in his own honour. It is undoubtedly identical with the Ilha do Anno bom. The omission of this island on Soligo's "*Guinea Portugalexe*,"⁵ which was drawn immediately after the return of Cão from his first voyage in 1484, does not conclusively prove that the island had not been discovered at that time, for Duarte Pacheco Pereira, the author of the '*Esmeraldo de situ orbis*,' who wrote his work after 1505, and had access to all official documents, was equally ignorant of its existence.⁶ The existence of the island cannot, indeed, have remained unknown for any length of time to vessels trading to the Gulf of Guinea, for it lies within the equatorial current, which carries a homeward-bound vessel at a rate of from 20 to 50 miles daily to the westward. Already Ruy de Sequeira, returning from the Cabo de S. Catharina, may thus have passed within sight of it, for it is visible for over forty miles, whilst traders bound homeward from Benin or Bonny, and desirous of avoiding the tedious struggle against the strong current flowing eastward along the Guinea coast, would try to make all the southing they could, and having passed Prince's Island and St. Thomé, would cross the Line, one or two degrees beyond which they would be carried westward by the equatorial current. By this route the passage from Bonny to Sierra Leone has been accomplished in less than three weeks, whilst vessels keeping near the coast have been as long as three months. This southern course may frequently have taken a vessel within sight of Anno bom, and as most of these vessels were traders and not royal ships, this may account for the ignorance of official historians. Indeed, I believe that the island was sighted or "discovered" repeatedly without much notice being taken of the fact. Valentin Ferdinand, on the authority of Gonçalo Pirez, a Portuguese skipper, who had been engaged for years in the trade of S. Thomé, states that Anno bom was discovered on January 1, 1501 in a caravel of Fernão de Mello, the captain donatory of that island, when it was found that seven years previously a fishing boat with three negroes in her, only one of whom was still alive, had been carried thither by the currents from the river Congo.⁷ This seems to have been the "official" discovery of the island, which has retained the name then bestowed upon it up to the present time, but it was not the "first" and real discovery, unless we reject the account

⁵ See p. 26.

⁶ As was also Waldseemüller or Hylacomilus when he compiled his map of the world in 1507, and the modern maps which appeared in the Strassburg edition of Ptolemy in 1513. Waldseemüller was born about 1470 at Radolfzell, studied at Freiburg, and is the author of two large maps of the world only recently discovered and published by J. Fischer and F. R. von Wieser (the oldest map of the world with the name America, Innsbruck, 1903). He died in 1521. See L. Gallois ('*Americ Vesputici*,' 1900) and F. Albert ('*Zeitschrift f. Gesch. des Oberrheins*,' XV. 1901, p. 510).

⁷ Bol. da Soc. de Geogr., Lisbon, VI., 1900, p. 353.

of Behaim altogether, confirmed as it is by his Globe. Val. Ferdinand, in the MS. already frequently referred to, presents us with three rude maps of the island, each differing from the other to so great an extent that if it were not for the titles, or the place where these maps are found, they could not possibly be believed to refer to the same island. The first of these maps (numbered 1 in the accompanying Map 5) has already been published by Dr. S. Ruge;¹ tracings of the two others I owe to the kindness of Dr. G. von Laubmann, the Director of the Munich Library, where the MSS. are kept.² The first of these maps agrees, in its general features, with the delineation upon the Portuguese chart which Alberto Cantino caused to be designed at Lisbon for his patron, Hercules d'Este, in 1502. The second map bears the title "Ilha diogo Cam," which seems to show that Ferdinand, when he made that sketch, believed the island to have been discovered by Diogo Cão, or, at all events, to have been named in his honour. A third map of the 'Ilho ano boo' has apparently been rejected by the author as untrustworthy, for he has drawn three lines of deletion across it. The marked differences in these three outlines are equally observable in the few charts drawn up to 1502 and still available. And these differences not only extend to the outline of Annobom, but also to the latitude assigned to it, and of its bearings and distances from S. Thomé and the Cabo de Lopo Gonçalves.³

	Behaim, 1492.	Cantino, 1502.	Cantino, c. 1502.	Hamy's Chart, c. 1502.	Modern Charts.
S. Thomé latitude .	8° 0' S.	0° 30' N.	1° 30' S.	0° 0'	0° 12' N.
Annobom latitude .	12° 30' S.	8° 0' S.	5° 0' S.	1° 25' S.	1° 25' S.
Distance from S. Thomé, miles]	270	162	170	90	100
S. Thomé bears .	N. 80° W.	N.	N.	N. 15° E.	N. 80° E.
Cabo de Lopo Gon- çalves bears .	E. 85° N.	E. 40° N.	E. 85° N.	E.	E. 12° N.
Distance to Cabo de Lopo Gonçalves, miles]	320	175	180	150	186

These differences seem to justify the conclusion that the draftsmen or compilers of these early charts depicted the island from map sketches brought home by successive navigators, who sighted it from a distance, but did not think it worth while to examine it more closely, so as to enable them to depict the island as correctly as the other islands in the Gulf of Guinea had been depicted years before.⁴

¹ '27. Jahresb. des Vereins für Erdkunde zu Dresden,' 1901.

² *Cod. Hisp.* 27 ff., 339r and 343r and V.

³ For Cantino see pp. 26 and 27. Nicolas de Canerio was a Genoese. Facsimiles of his map of the world have been published by Callois ('*Bull. Soc. de Géogr.*,' Lyon, 1890) and G. A. Marcel, Keeper of the Cartogr. Collection of the Bibl. Nat. ('*Reproduct. des Cartes et Globes*,' &c.). The chart, now the property of Prof. E. T. Hamy of the Musée d'Ethnogr., Paris, was bought at the sale of the library of the late Captain King, London. Facsimiles have been published by Dr. Hamy himself and in Nordenskiöld's '*Periplus*.'

⁴ In proof of which see Map 5, insets.

Conclusion.

Having thus dealt at considerable length with the history of discovery and early cartography of Western Africa I shall endeavour to summarise the results in as far as they throw light upon the voyage which Behaim asserts he made in company with Diogo Cão.

We may dismiss without hesitation Behaim's assertion that he was appointed "Captain" of one of the vessels which sailed in that expedition. Such a command would not have been given to a foreign merchant only recently arrived in Portugal, and absolutely ignorant of naval affairs. He might, however, have been permitted to embark as a "volunteer" or as a trader. If he accompanied Cão as "cosmographer," as is asserted by several of his biographers but nowhere claimed by himself, the results must have been exceedingly disappointing if we are to look upon the delineation of the west coast of Africa on his Globe as the outcome of his labours.

There is moreover the evidence of the "inscribed rocks" only recently discovered on the Congo (see p. 22). These prove conclusively that Behaim played no leading part in Cão's second expedition, and that if he accompanied it at all it must have been in a very humble capacity.

Behaim tells us that Cão and himself left Portugal in 1484, and returned after an absence of 16, 19 or 26 months. As Behaim only arrived in Portugal in June 1484 at the earliest, he cannot be supposed to have started before July. His return, consequently, would have taken place in October 1485, January or August 1486. What then becomes of the knighthood conferred upon him on "Friday, February 2, 1485," or of the deed of partnership signed at Lisbon on July 12, 1486 by F. Dulmo, the captain of Terceira, and João de Estreito of Madeira, anent an expedition in search of the island of the Sete Cidades which was to have been joined by a "cavalleiro alemão," whom Ernesto do Canto,⁵ a very competent judge, identifies with Martin Behaim, he being the only German at that time in Portugal to whom this description would apply?

As a matter of fact, if we accept the dates given, Behaim cannot possibly have taken part in the second voyage of discovery commanded by Diogo Cão. That famous navigator, having returned from his first voyage, was at Lisbon in April 1484. He only started on his second voyage of discovery after June 1485,—perhaps as late as September. Are we to suppose that during the interval between his two voyages of discovery, say between June 1484 and August 1485, Cão paid another visit to the Congo, perhaps for the purpose of taking back the hostages whom he had carried off in 1483? There exists no record of such a voyage, and Behaim's own account and his Globe distinctly point to a voyage extending far beyond the point reached by Cão in the course of his first

⁵ '*Arch. dos Açores*,' I., p. 341, IV., pp. 440, 443.

voyage. Of course, Behaim may have made a mistake in his dates, and if instead of 1484-5 we read 1485-6 he may indeed have accompanied Cão in his memorable second voyage. But here again Behaim's own statements render this most unlikely. Cão, being bound on a voyage of discovery, would naturally have made haste to reach the Congo. He certainly would not have delayed in the Gambia to get rid of his horses and their costly harness, or wasted time in tedious barter with Jalof and Sin. Neither is it likely that many of Cão's men died owing to the heat, which may well have happened to an expedition which stayed for some time in the Gulf of Guinea. Indeed, it was the great mortality among the Portuguese who were sent to Benin in 1486 which caused a factory occupied by them in that kingdom to be abandoned soon afterwards.¹

Lastly there is the Guinea pepper, brought home in proof of the discoveries that had been made. In fine, all that Behaim tells us might have happened in connexion with a trading voyage, such as that of João Affonso d'Aveiro. If that Captain sailed in 1484 and Behaim joined his ship at the end of June or in the beginning of July, soon after his arrival in Portugal, he might have been back in Lisbon after an absence of seven months, in time to be knighted by the King in February 18, 1485. A voyage to Benin and back would have occupied about four months, and there remained thus three months available for trading on the Gambia and elsewhere. Proceeding twelve leagues up the Rio Formoso, which according to D. Pacheco Pereira was navigable only for vessels of fifty tons burthen,² J. A. d'Aveiro reached Gato, the deadly climate of which carried off not only the leader himself but also many of his companions.³ Having taken on board the ambassador of the King of Benin and a cargo of pimenta de rabo, the expedition left for Portugal. On the homeward route, when making for the serviceable equatorial current, the Insula Martini of the Globe was sighted. Lisbon was reached after an absence of only seven or eight months, and Behaim, in recognition of the services he had rendered, was knighted on February 18, 1485. But if we suppose d'Aveiro to have started only in

1485, immediately after this honour had been conferred upon Behaim, sixteen months might have been expended upon this voyage, and yet he would have been back in Lisbon in July 1486, in time to accede to the agreement about a proposed search for the island of the Sete cidades.

Having given this subject the most careful consideration, it is my belief that Behaim was not a member of Cão's expedition, but that he may have made, and probably did make, a voyage to Guinea, and that he probably did so on board the vessel of João Affonso d'Aveiro. The Globe with its legends and the account of his voyage given to the editor of the 'Chronicle' were calculated to convey an idea that the expedition which he had joined was the first to cross the line into "another world," and ultimately doubled the southern cape of Africa. In Portugal, where the facts were known, he would not have dared to put forth such claims or such an incorrect delineation of the west coast of Africa. It was easy, however, to deceive the worthy burghers of his native town, who knew little or nothing about the maritime enterprise of the Portuguese, and looked upon their townsman as a great traveller, as indeed he was, and a successful discoverer, which he was not.

VIII. BEHAIM'S KNIGHTHOOD, 1485.

WE learn from a memorandum in the archives of the Behaim family, that Martin Behaim was knighted on Friday, February 18, 1485. It is not in Behaim's handwriting, but is evidently based upon information furnished by him, and reads as follows:—⁴

1485 adj 18 Febrer auf einen Freitag in Portügal in der Stadt albaßawas (Alcaçovas) in sandt falcators kirchen nach der tag mes wartt ritter geschlagen M. B. von Nurnberg von der Hand des Grofsmechtigen Konig Hern Johanne des andern von Portügal, vnnnd Konig von algarbia vnnnd Konig in affrica vnnnd Konig in Genea, vnnnd sein totten darzu was des Konig selb der in vmbgürtelt sein fiserit vnnnd der Herzog von begia der ander dot der im vmbürtet den rechten sporn, vnnnd der drit dode der graue cristoffel de melo des conicks vetter gurtot in den linken sporn, vnnnd der virt dott was der Graff Fernando Martins Maßkarinis (Mascarenhas) der den ritter den renhut auffvzelt vnnnd in waspet vnnnd der Konig der in ritter schlug die gefechach in beibeßen aller furst vnnnd ritterfchaft vnnnd der Konigin.

1485, on Friday the 18 of February, M. B. of Nürnberg was knighted in the Church of the Saviour at Alcaçovas in Portugal, after the morning mass, by the hand of the most potent King John II. of Portugal, King of Algarve, King in Africa and King in Guinea. And his sponsors were the King himself, who girth on his sword, and the second sponsor was the Duke of Beja, who girth on his right spur, and the third the grey Christopher de Mello, the King's cousin, who girth on his left spur, and the fourth sponsor was Count Fernando Martins Mascarenhas, who put on his morion (helm) and armed him, and the King who dubbed him Knight. This was done in the presence of all the Princes and Knights, and of the Queen.

¹ De Barros, 'Asia,' F. I., p. I., p. 179.

² D. Pacheco Pereira, 'Esmeraldo,' p. 72, had visited Gato four times, but refers neither to the factory established there nor to J. d'Aveiro.

³ I agree with J. Codine ('Bull. de la Soc. de Géographie,' Paris, 1869, II., and 1876, I.) that d'Aveiro died during the first voyage to Gato and not in the course of a second expedition after a factory had been established at the place. I cannot, however, accept the remainder of his speculations concerning the expeditions of Cão and d'Aveiro. He assumes both navigators to have started in October, 1484, both bound for southwestern Africa. He credits Cão with having set up three padroes: the first on the Congo in 1485, the second (that of S. Agostinho, in 13° 23' S.) on August 15, 1486, the third at Cape Cross. J. A. d'Aveiro, who was accompanied by Behaim, is supposed to have set up two padroes, viz., one on Monte Negro in 15° 40' S., on January 12, 1485, as stated on the Globe, the second at Cape Frio, which he identifies with San Bartholomeu Viego, in August, 1485. Benin was visited on the homeward voyage, and the vessel returned to Lisbon in May, 1486. The death of d'Aveiro enabled Behaim to claim credit for an expedition in which he only held a subordinate position. Cão came back to Lisbon in April, 1486.

⁴ First published by Doppelmayr, 'Histor. Nachrichten von den Nürnberg. Mathematicis u. Künstlern,' Nürnberg, 1730, p. 30. Murr, p. 130, published a more correct version.

Sr. Sebastião Francisco de Mendo Trigozo, who, strange to say, failed to identify the persons named in this memorandum, would have us reject this account altogether as quite improbable (*de todo inverisimil*). In this we agree with him if it were intended to describe the reception of a *Cavalleiro* into the famous and powerful order of Christ,¹ as is assumed by Murr, Ghillany and Günther. Behaim himself certainly laid no claim to that distinction: had he done so, the habit and badge of the Order—a golden cross with red enamel—would most certainly have been shown conspicuously in his family portrait. (See Frontispiece.) Moreover, in 1485 the Knights of the Order were still bound by the monastic vows of chastity, poverty and obedience. It was only after the accession of King Manuel, in 1495, that the *Cavalleiros* of the Order were permitted to marry.² Yet Behaim married a short time afterwards, and it will surely not be contended that he was in a position to obtain a Papal dispensation for doing such an unlawful thing.

The German historians mentioned above fully accept the Knighting of Behaim, but they object to the date given, viz., February 18, 1485—as only a month before, according to a legend on his Globe, he was still far away in Africa at Cabo negro, and it would have been utterly impossible for him to be back in Europe for the ceremony described. It must, however, be pointed out that in the date given above, day, month and year are concordant, that not until 1491 does the 18th of February again fall on a Friday, and that Behaim had already claimed the title of a Knight when he turned up at Nuremberg in 1490. Under these circumstances we must either reject the date on the Globe or that of the above memorandum. I do not hesitate to do the former.

The circumstances described in the above memorandum bear in every respect the impress of truth. The King, with the whole of his household, is known to have left Montemor o novo (on account of the plague) for Beja in January, 1485. His route led him through the ancient town of Alcaçovas, where there was a small castle, built by D. Diniz, in 1290, to which was attached a chapel dedicated to the Saviour, the ruins of which still exist. The ceremony described may fairly be supposed to have taken place within this building.

The Duke of Beja, raised to that dignity in 1484, is best known to history as King Manuel the Fortunate.

The Mellos of the house of the Counts of Olivença might certainly claim to be "cousins" of the King. Martin Affonso de Mello, guarda-mór or chief esquire of John I., was able to trace his pedigree back to a son of King Affonso III. (1248-1279).³ Other Royal connections are mentioned in the Dedication to João de Mello

of a reprint of Resende's 'Chronica del Rey Dom Joam II.' published at Lisbon in 1752.

Quite recently, in 1479, D. Alvaro, Count of Tetugal, a brother of D. Ferdinand II., Duke of Bragança, and descended from D. Affonso, the bastard son of King John I., had married D. Filipe, the daughter of Rodrigo de Mello, Count of Olivença.⁴ And not only were the Mellos distantly related to King John II., they were also held in high favour and employed in honourable offices. Gomes Soares de Mello, a brother of the Count of Olivença, was a Councillor (*Cavalleiro do Conselho*) of the King, in 1484; Manuel de Mello held the post of chief groom of the chamber (*Reposteiro mór*), whilst Christovão de Mello was one of the 111 *Cavalleiros fidalgos* of the King's household in the year named.⁵ Christovão, who was governor (*alcaide mór*) of Evora, was killed in a skirmish outside Ceuta, in 1488.⁶

D. Fernão Martins Mascarenhas commanded the King's Bodyguard (*Ginetes*) in 1484,⁷ and certainly was with the King at that time. In 1488 he commanded a fleet which was sent to Africa (Morocco), and in 1495 he stood by the King's death-bed.⁸

When it is asked what had Behaim done to render himself deserving of the distinction of a knighthood, we are referred to his supposed services as an astronomer and cosmographer. These I have already fully considered, and suggested that if Behaim accompanied one of the expeditions to Guinea such a reward might have been appropriately bestowed upon him. Failing this, it is possible that Behaim may have been engaged in one of the numerous skirmishes which took place at Ceuta and elsewhere in Africa, for the inscription on the memorial chandelier at Nuremberg tells us that he "stoutly fought the African Moors."⁹

It is, however, quite possible that he owed his knighthood to personal influence. He belonged to an old Patrician family of the famous Imperial city of Nuremberg, and these Patricians, or *Geschlechter*, not only claimed to be of noble birth, but were certainly superior in wealth,

¹ A. Braancamp Freire, 'Livro dos brasões da Sala de Cintra,' 1901, I., p. 210. D. Beatriz de Vilhena, their daughter, married in 1500 D. Jorge, the illegitimate son of John II.

² See A. Caetano de Sousa, 'Provas da historia genealogica,' II., 1742, pp. 176-181, where are given the names of all persons holding position in the King's household in 1484. A D. Fernão de Mello, who is described as a cousin of the King (Paiva Manso, 'Hist. do Congo,' p. 19), was granted the captaincy of St. Thomé in 1499.

³ Ruy de Pina, c. 35; Resende, c. 751.

⁴ A. Caetano de Sousa, III., p. 131.

⁵ Ruy de Pina, cc. 18, 39; Garcia de Resende, cc. 53, 76.

⁶ Wolf Holzschuher, also of Nuremberg and of the same social rank, having distinguished himself in Africa, was knighted on February 2, 1503, and granted an augmentation of his arms, consisting of a Moor's head and the cross of the Order of Christ, a grant confirmed by the Emperor Charles V. in 1547, in favour of all the members of that Patrician family (Biedermann, 'Tafel,' 178; Murr, p. 114). An Augsburg, Anton Herwart, the companion of Muntz, was knighted on November 24, 1495 (clm. 431, fol. 163, in Munich Library).

¹ Definições e Estatutos dos Cavalleiros e Freires da Ordem de N.S. Jesu Cristo. Lisbon, 1628.

² Goes, 'Chron. de D. Manuel' (Lisbon, 1666), I., c. 17.

³ Antonio Caetano de Sousa, 'Historia genealogica da Casa Real portugueza,' III., 1737, p. 415.

intelligence and education to the minor nobility of that age, even though the arms they sported were "assumed," and not won in the field, as were those of their rural rivals. But Martin, in addition to claiming rank as a *fidalgo alemão*, or German nobleman, was about to marry the daughter of the Captain donatory of Fayal, a noble Fleming connected by marriage with several of the most eminent families of the Kingdom.

Of course he may have had other claims, and if we might accept the assertion that Behaim not only stood high in favour with King John, but even held a salaried appointment about his court, this would account sufficiently for so inexpensive a distinction as a knighthood. But no evidence in favour of such an assumption has ever been forthcoming. His not being mentioned among the members of King John's household for 1484¹ is, of course, not conclusive, for Behaim had only then recently come to Portugal, but neither is he mentioned in the 'Chronicles' of Ruy de Pina or Garcia de Resende, who must have met him frequently, and would hardly have failed to have referred to him had he really held the distinguished position at Court which is claimed on his behalf. But, after all, the future son-in-law of the Captain donatory of Fayal, the husband of a former lady-in-waiting in the household of the late D. Fernando, the King's father-in-law, would be readily admitted to the King's presence. His relatives in Nuremberg certainly believed him to have been on a pleasant footing with King John, when young.²

This much is certain, that Martin Behaim claimed to be a knight. In 1494 (App. X.) he asked that his letters should be addressed "Dno. Martino Beheimo Militi";³ on the memorial chandelier at Nuremberg his son describes him as "Portugaliae Regis Miles auratus"; in the legal documents drawn up during his presence at Nuremberg, 1490-1493, he is described as "Ritter," and in the letter which the Senate of that city addressed to King Manuel in 1520 he is referred to as "eques auratus." Moreover, his Portuguese relatives objected to young Martin being employed in trade, as his father had been "a man of position and a knight," and lastly there is the treatise 'De prima inventione Guineae,' which its author, Diogo Gomez, communicated to "Martino de

Bohemia, inclito Militi Alemão"—the renowned German Knight!⁴

These references show at all events that Behaim was looked upon by his contemporaries not only as a German nobleman, but also as a knight of the King of Portugal. The only apparent exception to this rule seems to be the letter of pardon, already quoted, which very disrespectfully, and quite contrary to the painful punctiliousness of the time, refers to the sister of Joz d'Utra (Hurter) as the wife of one (de hum) Martin de Boeme!

IX. BEHAIM AND COLUMBUS.

I propose in this chapter to deal with the relations which are supposed to have existed between Behaim and Columbus.

Antonio de Herrera,⁵ in his 'Historia General de las Indias' (Dec. I., lib. 6, I., c. 2), after referring to Columbus's views as to the ease with which India might be reached by sailing to the West, adds that, "he was confirmed in this opinion by his friend Martin de Bohemia, a Portuguese, a native of the island of Fayal, and a cosmographer of great judgment (de gran opinion)."

It is quite possible that Columbus and Behaim met during the former's residence in Portugal, and that they discussed the scheme of discovering the East by the West. Behaim had arrived in Portugal in May or June, 1484, and stayed there, or in Fayal, until the spring of 1490, when he left for Nuremberg. Columbus, on the other hand, made his first appearance in Portugal in 1476.⁶ It was in Portugal that he conceived the idea of reaching the spice-lands of India by sailing across the Western Ocean. It was in Portugal he first studied the 'Imago Mundi' of Pierre d'Ailly,⁷ the 'Historia rerum

⁴ Published by Schmeller ('Abh. d. phil. Cl. d. K. bayr. Ak.,' Munich, t. IV., 1847), and by Gabriel Pereira ('Bol. da Soc. geogr. de Lisboa,' t. XVII., 1901). Pereira identifies this Gomez with the Gomez "vinagro" of Azurara (c. 13). He was born about 1420, was a page (moço da camera) of Prince Henry, was knighted in 1440, was appointed a magistrate (juiz) at Cintra by King Alfonso in 1466, and became warden (almoxarife) of the Royal castle at that place in 1482 ('Archivo dos Açores,' pp. 77-87). The MS. at Munich is in the hand of Valentin Ferdinand. Monetarius saw the original at Lisbon, for he quotes from it.

⁵ Antonio de Herrera was born in 1559. He was appointed Historiographer of India in 1598, and as such had access to the Spanish archives. The first Decade of his 'Historia General de las Indias, 1492-1554,' was published at Madrid in 1601. He died 1625.

⁶ See H. Vignaud's able 'Études critiques sur la vie de Colomb,' Paris, 1904.

⁷ Pierre d'Ailly (Petrus de Alliaco) was born at Compiègne in 1350, rose to high honours in the Church, and died at Avignon, Bishop of Cambrai and Cardinal, 1420. He is credited with being the author of one hundred and fifty-three works. His 'Imago Mundi,' largely based upon Roger Bacon's 'Opus Majus,' was written in 1400, but only published, at Louvain, about 1480. A 'Compendium Cosmographie' was written in 1413, after he had become acquainted with Angelo's Latin translation of Ptolemy (Salambier, 'Petrus de Alliaco,' Paris, 1886).

¹ 'Livro das Moradias da Casa do Sr Rei D. João 2º,' 1484, and P. Antonio Caetano de Sousa, 'Provas da historia genealogica da Casa Real,' Lisbon, II., 1742, pp. 176-181.

² Michael Behaim in a letter of November 12, 1518, to J. Pock (Ghillany, Doc. XVI., p. 112), writes with reference to Behaim's son: "His late father, whilst young, was much liked by the old King, but how his affairs turned out as he got old you are likely to know better than I do."

³ "Miles" originally meant soldier, and in the feudal times vassal or liegeman; "miles auratus" was originally a soldier carrying a shield inlaid with gold; "auratus," during the Middle Ages, referred to an arm- or ankle-ring which knights wore to show that they were under vows; "miles" or "eques cingulo accinctus" meant a belted knight or chevalier. "Miles," however, was generally used as a synonym for "eques," knight. (See G. A. L. Henschell's 'Glossarium'.)

ubique gestarum' of Pope Pius II.,¹ Mandeville's 'Travels',² and other works, of which several with marginal notes by himself and his brother Bartholomew are still to be found in the Colombine Library at Seville. At Lisbon he listened to accounts, more or less fanciful, of voyages beyond Madeira and the Azores. Having matured his scheme of discovery, he submitted it to King John. The King seems to have listened with favour to the proposals of this persistent stranger, but his scientific advisers, D. Diogo Ortiz de Villegas, Master Rodrigo, and Master Josepe or José,³ looked upon Columbus as a visionary, and upon his scheme as not likely to yield any profit, if not altogether impracticable. And they were justified in their opinion if they had approximately correct notions as to the extent of Asia and the consequent vast breadth of the Western Ocean, which up till then had in vain been navigated by Portuguese expeditions in search of imaginary islands depicted upon the charts.⁴ But the King, notwithstanding this unfavourable report, might have provided a caravel had not the reward claimed by the Genoese in case of success been most unreasonable. Moreover, it was thought preferable to devote the resources of the kingdom to the prosecution of the voyages of discovery round Africa, which in the course of time yielded a direct sea-route to India and Cathay.⁵

Columbus, disappointed, turned his back upon Portugal at the end of 1484 or in the spring of 1485. But in Castile, too, which was still engaged in the struggle with the Moors, he met with little encouragement, and he seems to have made fresh overtures to King John of Portugal. Such, at least, may be judged to have been the case from the tenour of a letter which the King wrote to him on March 20, 1488,⁶ in which he guaranteed that Columbus should not be proceeded against, civilly or criminally, on account of any offence he might have

committed.⁷ Columbus did not at once avail himself of this permission, for on June 16, 1488, he was still at Seville, but probably started for Portugal soon after the birth of his son Ferdinand, on September 28, 1488. He certainly was at Lisbon in December, for he was present when the King received the report of Bartholomeu Dias on his return from the memorable voyage round the Cape of Good Hope. But, however friendly his treatment by the King, Columbus failed once more in gaining acceptance for his adventurous proposals. He returned to Spain. Granada, the last stronghold of the Moors in Spain, fell on January 2, 1492; his conditions, in spite of their extravagance, were agreed to, and on August 3, 1492, he sailed from Palos on his momentous passage across the Atlantic. And though he did not discover the promised ocean highway to the spice-lands of India or to the wealthy cities of Cathay, he revealed, unconsciously, the existence of a veritable 'Mundus novus,' the existence of which had been foreshadowed by Crates of Mallos and even earlier speculative cosmographers, but which Columbus himself refused to recognise down to the day of his death.⁸

On March 8, 1498, on the triumphant return from his first and most daring voyage, he once more called at Lisbon. Behaim at that time was still absent at Nuremberg.

It will thus be seen that the opportunities for personal intercourse between Behaim and Columbus were not many, especially if it be borne in mind that both were frequently absent from Lisbon, the one residing usually in the island of Fayal, the other undertaking occasional voyages to England and the Guinea coast. The "opinions" held by Columbus surely needed no "confirmation" on the part of Behaim. In 1484, the earliest date when the two men could have met, the mind of Columbus on the subject of his proposed voyage of discovery had been fully made up, and it is not likely that a young German merchant, quite new to questions of that kind, would have obtruded his opinions upon a man so much his superior in age and experience.

¹ It has been suggested that Columbus was involved in the conspiracy headed by the Duke of Visen, whom the King killed on August 23, 1484; or that he obtained surreptitiously a copy of Toscanelli's Chart and letter, but it seems more probable that he left Lisbon secretly in order to escape being prosecuted for heavy debts incurred by him. We know, from a codicil to his last will and testament, that when he left Lisbon he owed about two hundred ducats and half a mark of silver. He instructed his son Diego to discharge these debts "for conscience's sake." Diego only remembered these debts on his own death bed, in 1523, when he ordered them to be paid so "that his father's and his own soul should rest in peace" (Navarrete, II., doc. 152).

² It is true that Columbus, after the discovery of the Orinoco, in 1498, spoke of "most extensive lands to the south, not known hitherto," but this "Mundo novo," to his mind, was merely an appendage of Asia. This is clearly shown by his brother Bartholomew's map (see p. 36, No. 4). Peter Martyr (Letter No. 136, October 1, 1493) already doubts that the islands discovered by Columbus adjoined India, though merely on the ground that the habitable world, according to Ptolemy, had an extent of only 180° in longitude.

F

¹ Enea Silvio de Piccolomini (Pius II.) was born at Pienza in Tuscany in 1405, became Private Secretary of the Emperor Frederick III. in 1442; Cardinal in 1455; and was elected Pope in 1458. He died in 1464. His 'Opera' were published at Basel in 1471, his 'Historia' at Venice in 1477. (G. Voigt, 'Enea Silvio als Papst,' Berlin, 1852-53; H. Berg, 'Enea Silvio als Geograph,' Halle, 1901.)

² Columbus told his friend Andres Bernaldes, the Curate of Villa de los Palacios, that he had read Mandeville's 'Travels' first published in 1480. (A. Bernaldes, 'Historia de los Reyes Catolicos,' Seville, 1870, c. 123.)

³ Concerning these see Ch. VI. The question of the breadth of the Western Ocean is dealt with in Ch. XIX.

⁴ Harrisse, 'The Discovery of North America,' Paris 1892, p. 655.

⁵ It was after the rejection of the proposals of Columbus that his brother, Bartholomew, proceeded to England, where, on February 13, 1488, he had completed a map of the world which he intended to present to Henry VII. This map seems to be lost past recovery. (Ferdinand Colon, 'Vida de D. Christobal Colon,' c. 10; Las Casas, 'Historia,' I., p. 225, and list of errata.) In England the year began on the 25th of March, and if the date given is according to the English style, we ought to read February 13, 1489.

⁶ This letter is published in Navarrete's 'Coleccion,' II., Madrid, 1859, doc. No. 2. A. C. Teixeira de Aragão, 'Breve noticia sobre o descobrimento de America,' Lisbon, 1892, p. 26, doubts the authenticity of this letter.

But though Behaim may never have held personal intercourse with Columbus, or influenced his cosmographical theories, there can be no doubt that he shared the erroneous views held by the successful Genoese as to the narrowness of the Ocean Sea and the facility with which it might be crossed, and so persistently and successfully urged by him in favour of his proposals. A glance at Behaim's globe proves this. We there find Antilia, the island depicted upon the chart which Columbus had with him, but looked for in vain on the 17th and 25th of September; as also Cipangu (Japan), his declared goal, which he unhesitatingly identified with Cuba.¹ These geographical features agree absolutely with what we know to have been the "opinions" held by Columbus. Whether Behaim derived them from a copy of Toscanelli's chart, or from some other source, shall be considered (p. 64).

Further evidence in favour of the contention that Behaim shared the views of Columbus with regard to the small breadth of the ocean which was supposed to separate the West from the East is furnished by a letter which Hieronimus Monetarius or Müntzer, a Nuremberg physician, addressed to King John in July, 1493, and in which he is recommended to avail himself of the services of Martin Behaim in an expedition fitted out to "disclose the East by the West." The arguments employed by Monetarius in favour of such an expedition are identical with those previously put forth by Columbus, and there can be no doubt that this letter² was written at the suggestion of Behaim and its contents inspired by him. It is curious, however, that such a letter should have been written at all, considering that Behaim is supposed to have been *persona grata* with King John, whilst Monetarius was merely an obscure man of learning in a distant German town.

X. BEHAIM AND MAGELLAN.

FROM Columbus we turn to Magellan.³ Antonio Pigafetta,⁴ the companion of Magellan, and historian of the first voyage round the world, having told us that it was thought formerly that the broad estuary to the south

of the Cape of St. Maria afforded access to the South Sea, takes us to a strait discovered on the day of the Eleven Thousand Virgins in 52° S., and says: "Had it not been for the captain-general we could not have found the strait, for we all thought and said that it was closed on all sides. But the captain-general, who knew where to sail to find a well-hidden strait, which he saw depicted on a map in the treasury of the King of Portugal, which was made by that excellent man, Martin de Boemia, sent two ships, the 'Santo Antonio' and the 'Conception' to discover what was inside the cape of the bay. We, with the other two ships, stayed inside the Bay to await them."

It seems, however, that Magellan's trust in the said map was not absolute, for a little further on Pigafetta tells us that "had we not discovered that strait the captain-general had determined to go as far as 75 degrees towards the Antarctic Pole."

Frey Bartolomé de las Casas,⁵ the famous "Protector of the Indians," throws further light upon the plans of Magellan. He was actually present in January, 1518, at Valladolid, when Magellan pointed out to the Lord Chancellor of Castile, J. R. de Fonseca, the Bishop of Burgos, the route which he proposed to follow in making his passage to the Moluccas. He did this by means of a neatly painted globe, upon which the supposed strait had been omitted, so that he might not be robbed of his secret! I cannot believe in so absurd a device. The very existence of a blank upon the globe would have directed attention to the situation of the sought-for strait. It is far more likely that only those coast-lines were shown upon the globe which had been actually discovered up to 1518, and that all hypothetical features had been omitted. This, at all events, would have been in accordance with the prevailing practice in the case of marine charts. Sebastian Alvarez, the factor of the King of Portugal at Seville, confirms this view. He, too, saw the globe, in July, 1512, and says that it was the work of Pedro Reinel⁶ and his son, Ferdinand; and that between Cabo Frio and the Moluccas no land was laid down.⁷ I have no doubt that instead of Cabo Frio we ought to read Cabo de S. Maria, in which case the globe would have agreed with a Portuguese chart of that period, upon which the Cabo de S. Maria (to the north of the Rio de Solis) in 35° S. is shown⁸ as the furthest point known on the East coast of South America, as also with a

¹ Barros, 'Da Asia,' Dec. I., liv. III., c. 11; Journal of the first voyage, Sept. 17 and 25, Oct. 23, 1492.

² For a translation of this letter see Appendix IX., p. 118.

³ F. F. H. Guillemaud, 'Life of Magellan,' London, 1890.

⁴ A. Pigafetta was born about 1480, came to Spain in 1519, and returned to Italy in 1523, where he died about 1534. The MS. of his 'Primo Viaggio,' now in the Bibl. Ambrosiana at Milan, was published by Andrea da Mosto in t. V. of the 'Raccolta di doc. e studi pubblicati dalle R. Commissioni Colombino.' We quote the translation by J. A. Robertson, published at Cleveland, Ohio, in 1906.

⁵ Bartolomé de las Casas was born at Seville in 1474, accompanied Columbus on his first voyage, 1492-3, was consecrated a priest in S. Domingos in 1510, paid several visits to Spain to plead for a more humane treatment of the natives, and finally retired to Europe in 1547. He died, 1566, at Madrid. His famous 'Historia de las Indias' was begun in 1527, completed in 1547, but only published in 1575-6. (See Harris, 'Christopher Columbus,' I., p. 122).

⁶ A Portuguese "mestre de cartas," who entered the service of Spain, but returned to Portugal, and was granted a pension by John III. He was still alive in 1542 (Souza Viterbo, 'Trabal. naut. dos Port.,' I., p. 341).

⁷ Navarrete, 'Coleccion,' IV., doc. No. 15.

⁸ See p. 36, Maplet No. 10.

Memorandum presented by Magellan to King Ferdinand in September, 1519.¹

But to return to Frey Bartolomé. Having referred to the globe, he goes on to say that Magellan in the course of conversation stated that he would first go and seek the Cabo de S. Maria, near the mouth of the Rio de Solis; that then he would examine the coast to the southward, and, failing to discover a strait communicating with the South Sea (discovered only recently by Vasco Nuñez de Balboa), he would follow the usual course of the Portuguese in their voyages to the East, round the Cape of Good Hope.² Not a word is said about Behaim and his chart. A few pages further, however, Las Casas states, on the authority of Pigafetta, that Magellan felt sure of discovering a strait, "having seen it upon a chart in the treasury of the King of Portugal made by Martin de Bohemia, a great pilot and cosmographer."

Oviedo³ (Historia, liv. XX., c. 1) knows about the reported existence of Behaim's chart, admits that it may have suggested the existence of a strait, but maintains that its discovery was due rather to the capacity of Magellan than to the science of the "Bohemian."

Francisco Lopez de Gomara in his 'Historia general de las Indias' (Zaragoza, 1552, c. 91) knows all about Behaim and his "carta de marcar," but adds that "as far as he heard that chart showed no strait whatever, unless the Rio de la Plata or some other great river on that coast was taken for such."

Antonio de Herrera,⁴ who had access to the archives of Philip III., may have consulted there the original journal of Pigafetta, which had been presented to Charles V., and other documents, now lost to us, but what he tells us in his 'Historia general' (Dec. II., liv. II., cc. 19-21) about Behaim, whom he describes as a native of the island of Fayal and a cosmographer of great authority (de gran opinion), and the "hidden" strait, seems to have been borrowed from Las Casas, who was himself dependent upon Pigafetta.

¹ Navarrete, 'Coleccion,' IV., doc. No. 19. The object of this Memorandum was to prove that the Moluccas, according to the treaty of Tordesillas, lay within the Spanish sphere. Starting from S. Antão, the outermost of the Cape Verde Islands, Magellan computes the 370 leagues of the treaty to be equivalent to 22° of longitude. As a league was equal to 7,500 varas, or 6,269 metres, a meridian distance of 370 leagues in lat. 17° actually amounts to 21° 8 degrees, a very near approach to the truth. The Moluccas were supposed by him to lie only 176° to the west of this "linea de repartición," and to be thus within the Spanish sphere, their true distance being 187°, which placed them within that of the Portuguese.

² 'Historia de las Indias,' liv. III., c. 100, vol. IV., Madrid, 1876, p. 376.

³ Gonçalo Fernandez Oviedo y Valdes was born at Madrid in 1478, spent 1513-17 in Haiti, and was appointed Royal Historiographer on his return to Europe. He is the author of 'La Historia general y natural de las Indias Occidentales,' Seville, 1535-55, a new edition of which was published at Madrid, 1851-55. He died 1557.

⁴ See p. 14, note.

It is significant that João de Barros, the famous Portuguese historian, in the account of the voyage of his countryman Magellan ('Da Asia,' Dec. III., liv. 5, p. 8), whom the "devil had instigated" to desert his own King "for him of Castile," makes no reference whatever to the chart supposed to have existed in the King's treasury. It is evident that he knew nothing about such a chart, or he would surely have referred to it, if only to minimize Magellan's merit in discovering the sought-for strait leading to the South Sea. Gaspar Correa,⁵ in his 'Lendas de India,' is equally silent.

Indeed, the existence of Behaim's chart seems to be vouched for by Pigafetta alone, and considering the friendly personal relations which existed between him and Magellan, his testimony is undoubtedly of considerable weight. It has been unhesitatingly accepted by many subsequent writers, and among others by William Postel,⁶ a learned Frenchman, who speaks of the strait of Martin Bohemus, which separates the new world or Atlantis from the unknown southern continent or Chaesdia, but is named after Magellan because that navigator passed through it on his route to the Moluccas. He evidently looked upon Behaim as the hypothetical if not actual discoverer of this strait. Urbain Chauveton (Calveton), in the notes which he added to a Latin translation of Girolamo Benzoni's 'Historia del Mondo novo' (Venice, 1565, lib. III., c. 14), which was published at Geneva in 1578, confines himself to the statements made by Pigafetta, and as this work, up to 1650, appeared in at least ten editions, including translations into French, German, Dutch and English, the statement about Behaim's map gained wide currency, and was accepted by quite a host of compilers.

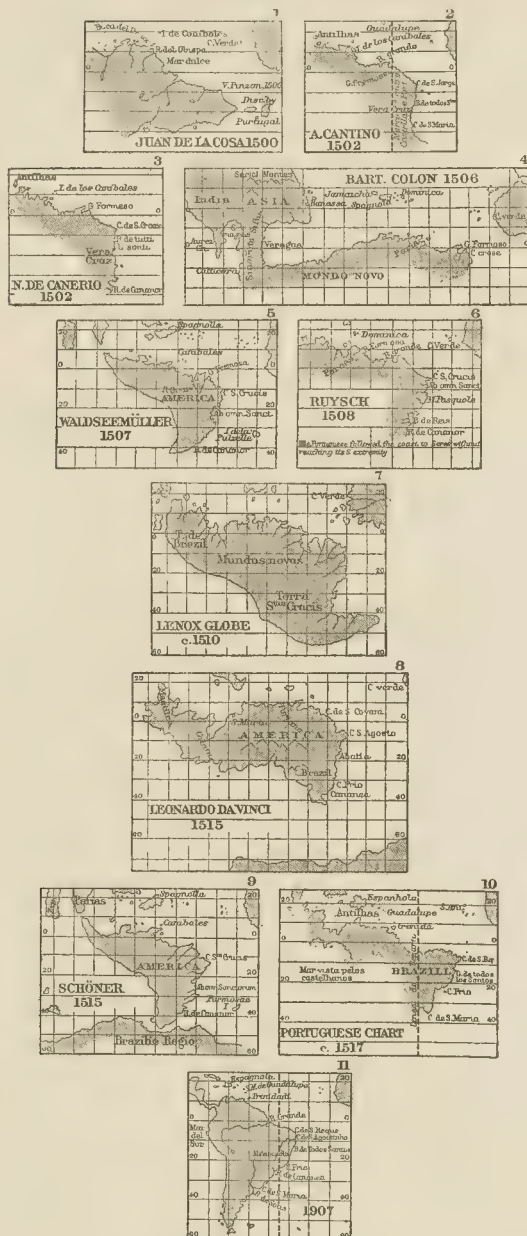
A sketch of the progress of discovery and exploration along the east coast of South America may help us towards a correct opinion as to the likelihood of Behaim having ever designed a chart resembling that with which he is credited by Pigafetta.

Christopher Columbus was the first to sight the mainland of South America, immediately to the south of the island of Trinidad. This happened on August 1, 1498. In the year after, in 1499, on May 18, Alonzo de Hojeda (with whom were Juan de la Cosa, the famous pilot, and Amerigo Vespucci) fell in with the coast further to the east, off Surinam, and followed in the wake of Columbus. In the following year, 1500, on the 20th of January, Vicente Yañez Pinzon, sighted the coast in lat. 8° 20' S. at a low point of land, which he called Cabo

⁵ Gaspar Correa went out to India about 1512 and died there after 1561. His great work remained in MS. until 1858-61, when it was published by the Academy of Sciences at Lisbon.

⁶ In his 'Cosmographiae disciplinae Compendium,' Basel, 1561, c. 2; 'De Universitate liber,' Paris, 1563. Guillelmus Postellus was born in 1510 at Barenton, in Normandy, and died in 1581. He was a distinguished Oriental scholar, able to read Arab geographers, was expelled from the Society of Jesus, and persecuted by the Inquisition.

TEN MAPLETS ILLUSTRATING THE CARTOGRAPHY OF SOUTH AMERICA, 1500-1517.



THESE MAPLETS ARE DRAWN ON A QUADRATIC PROJECTION AND ON A UNIFORM SCALE, SO AS TO BE READILY COMPARABLE.

1.—1500. Juan de la Cosa, the famous pilot, born at Santoña, on the Bay of Biscay, killed in a fight with Indians, 1509, who accompanied Columbus on his second expedition (1493-6), and Alonso de Hojeda (1499-1500), after return from which he compiled a chart of the world, embodying the entire extant delineation of the New World. Facs. in Nordenskiöld's 'Periplus,' Jomard's 'Monuments,' and by Raymon de la Sagra, with an 'Ensaio Biográfico,' by Antonio Vassano (Madrid, 1892).

2.—1502. Alberto Cantino had this chart drawn in Portugal and forwarded it to Hercules d' Este, Duke of Ferrara. The original is now at Modena. Harrisse, 'Les Corte Real' (Paris, 1883), published a facs. of the American portion; Prof. E. L. Stevenson, the entire chart, 1906.

3.—1503. Nicolaus de Canerio, of Genoa. His chart is merely a copy of a Portuguese one. See p. 29, note.

4.—1506. Bartolomeo Colon, from marginal sketches illustrating his brother Christopher's letter written from Jamaica in 1503 in a codex of the Bibl. Nazionale at Florence. R. Wieser, 'Die Karte des Bartolomeo Colombo' (Innsbruck, 1893).

5.—1507. Waldseemüller (Martin Hylacomilus), the author of the famous 'Cosmographie Introductio' (St. Dié, 1507), in which reference is made to a globe and a map of the world. Gallois, 'Les Géographes allemands de la Renaissance' (Paris, 1890), has published a facs. of the globe, whilst to J. Fischer, S.J., and F. R. von Wieser, 'The Oldest Map with the name America' (Innsbruck, 1903), we are indebted for a facsim. of the map. The 'Insule 7 delle puizelle' of this map, which Schöner on his globe (1515) calls 'Septé Formose Insule,' are not the Falklands, but the 'Insule Scti. Brandani sive puellarum' of Dulcert (1339), and the 'San Brandany y ysle de Pouzele' of Pizzigani (1367), which are identified with the seven islands of the Azores, the Canaries, or an imaginary group to the west of them. Isidore of Seville is responsible for their presence upon maps. Waldseemüller was born at Radolfzell about 1470, matriculated at Freiburg in 1490, and died 1521.

6.—1508. Joan. Ruysch, 'Map of the World,' in a Roman edition of Ptolemy. Ruysch is described as an experienced geographer and cartographer. In c. 14 of a 'Nova orbis descriptio,' appended to this edition of Ptolemy by Marco of Benevento, a monk, it is stated that the Portuguese followed the coast of Terra Sanctae Crucis to lat. 37° or perhaps 50°. A legend, to the south of the Rio de Cananor (*recte* Cananea) is evidently from the same source, viz., a misunderstood report on Vespucci's third voyage, 1501-2. Facs. in Nordenskiöld, 'Facsimile Atlas.'

7.—1510. The Lenox Globe. This globe is of copper and has a diameter of 127 mm. It was "discovered" at Paris, in 1855, by Richard Hunt, and is now in the Lenox Library, New York. It is described, with a facsim., by C. H. Coote, in vol. X. of the 'Encyclopedia Britannica,' and in Nordenskiöld's 'Facsimile Atlas.'

8.—1514. Leonardo da Vinci. This is a rough sketch apparently copied from a globe. See Major's 'Memoir' in 'Archæologia,' XL, London, 1865.

9.—1515. Johann Schöner, the celebrated mathematician of Nuremberg (and indifferent cartographer), was born at Karlstadt in Franconia in 1477, and died at Nuremberg in 1547. He is the author of several globes, the earliest of the year 1515, in illustration of which he wrote 'Luculentissima quædam terræ totius descriptio' (Nuremberg, 1515). Copies of this globe (which is printed) are at Frankfurt and at Weimar. See F. Wieser 'Magalhães-Strasse' (Innsbruck, 1881).

10.—1517. A Portuguese chart of 1509, with additions to 1515 or 1517, showing the results of the second voyage of Juan de Solis. Facsim. in K. Kretschmer's 'Atlas,' XII. A chart by Vesconte de Maiollo of Genoa, dated 1519, is identical with it. Both were first published in the atlas accompanying Kunstmann's 'Die Entdeckung Amerikas' (Munich, 1859).

11.—1907. A modern map of South America.

de S. Maria de la Consolacion.¹ He then turned to the north and west, discovered the mighty floods of the Marañon, and, like his predecessor, sailed through the Dragon's mouth into the Caribbean Sea. Diego de Lepe, who had left Palos about a month after Pinzon, fell in with the same cape, which he named Rostro hermoso—"the beautiful bill"—and seems to have explored the coast for some distance to the south, before he proceeded to his destination.

Pedro Alvarez Cabral was the first Portuguese who touched the coast of Brazil. Whether he was carried thither by the equatorial current against his will, or sought for it in virtue of the instructions he had received, is still an open question.² He sighted the land on April 21, 1500, in lat. 17° S., and as it was Easter tide he named a conspicuous mountain, which was in front of him, Monte Pascual, and the land itself Terra da Vera Cruz—the land of the true cross. A "safe harbour"—porto seguro—about forty miles to the north of his landfall, afforded him shelter from a storm. Having despatched Gaspar de Lemos to Europe with news of his discovery, he started, on May 3, on his disastrous voyage to the Cape of Good Hope and India. In the course of this voyage he perhaps discovered the small island of Trindade.³

So impressed was the King with the discovery of a resting-place for vessels sailing round the Cape that he almost immediately, on May 13, 1501, despatched an expedition from Lisbon to follow up the discovery made by Cabral. The name of the commander of this expedition is not known, but there is no doubt that Vespucci was a member of it. The expedition fell in with the

land in 5° S. at Cabo de S. Roque, after which it followed the coast, certainly as far south as the Rio de Cananea,⁴ in 25° S. On February 13 the vessels departed from the land, and having sailed in a south-easterly direction for 500 leagues, to 52° S., they discovered, on April 2, a barren island, along which they coasted for twenty leagues, after which they turned northward towards home.⁵

The Fleet of Affonso de Albuquerque, which left Lisbon on April 16, 1503, seems to have followed the coast of Brazil as far as an Ilha de Santo Amaro which, according to Duarte Pacheco is 3½ degrees to the north of Cabo Frio, which he places in 25°, its true latitude being only 23°. An island of that name off the harbour of Santos, in lat. 24° S., finds a place upon our modern maps, but it is very doubtful whether it is the island referred to by Pacheco.

The last expedition to be noticed had for its avowed object the search for a passage to the spice-lands of the Moluccas by doubling the southern extremity of the "New World." This expedition left Lisbon in June 1503. Gonzalo Coelho seems to have been in command; Vespucci sailed in one of its vessels and, on his own showing, played a leading part. The results were disappointing, for the highest latitude reached was 18° S.

This summary of explorations carried on up to Behaim's death, in 1507, shows us that the Rio de Cananea in lat. 25° 5' S., was the furthest point reached. The charts of the period bear this out,⁶ for upon none of them do we find a place name to the south of this river, occasionally corrupted into a Rio de Cananor, and placed as far south as 29° and even 40°. Nor had there been discovered any estuary, or bay, promising to lead into an Eastern Ocean. No "terra australis" or Antaretis is referred to, or shown upon any map. Under these circumstances we are justified in believing that the chart referred to by Pigafetta as showing a "strait" cannot have been the work of Martin Behaim, who died in 1507.⁷ At the same time there existed a belief that the southern

¹ Pinzon (Navarrete, III, doc. No. 69), in the evidence given in 1513, distinctly identifies the Cabo de Consolacion discovered by him with the Cabo de S. Augustin, but an examination of the charts of the period would justify us to look upon the capes consecutively known as Cabo de S. Maria de la Consolacion, Rostro hermoso, Cabo de S. Cruz and S. Jorge as being identical with Cabo de S. Roque of the Portuguese in lat. 5° 28' S.

² J. Norberto de Sousa e Silva ('Revista trimestral do inst. hist. do Brazil,' XV, 1852, p. 125) and Capt. A. A. Baldaque da Silva ('Centenario do Descobrimento da America,' Lisbon, 1892) argue in favour of design.

³ This would have happened during the first half of May, 1500, in which year Ascension Day fell on May 28 and Trinity Sunday on June 14. There is no doubt, however, that the small island now known as Trindade, was "found" on May 13, 1502, by Estevão da Gama. The reports of Thomé Lopes (Ramusio, I) and Mateo de Bergamo (Hümmerich, 'Vasco da Gama,' Munich, 1898, p. 193), who both were in this fleet, leave no doubt on this point. The island was once more "found" by Affonso de Albuquerque, in 1503. Duarte Pacheco Pereira, who commanded the "Conceição" in that voyage, calls the island S. Ascensão, and correctly gives its approximate latitude ('Esmeraldo de Situ Orbis,' Lisbon, 1892, p. 16; and also the letter of Giovanni di Empoli published by Ramusio). The island appears for the first time in Dr. Hamy's map, about 1502, but without a name. On a Portuguese chart (see No. 10 of our Maplets, p. 36), three islands are shown, viz., Ascension, Trindade and Martin Vaz. Ascension and Trindade evidently refer to the same island, while Martin Vaz, a rocky islet further east, is named after its discoverer, Martin Vaz Pacheco, who went with Pedro de Mascarenhas to India in 1511. Diego Ribero, 1529, has an "Ya de S. M. de agosto," which simply means Island of the Ascension of St. Mary, which is celebrated on August 15.

⁴ La Cananea is a festival celebrated on the first Thursday in Lent; in 1502, on February 10.

⁵ Valentin Ferdinand ('Abhdign. d. bayr. Ak. d. Wiss., 3 Cl., t. VIII., 1860, p. 787), in a notarial Act signed on August 4, 1504, refers to this expedition as having sailed to 53° S. Varnhagen, 'Amerigo Vespucci' (Lima, 1865, p. 110), suggests that Vespucci reached Southern Georgia in lat. 54°. Perhaps it was the island of Tristão da Cunha, in lat. 37° S., whither he was carried by winds and currents. M. P. d'Enciso, 'Suma de Geografia' (Seville, 1519) places a "tierra Austral" 600 leagues to the S.E. ¼ S. of Cabo de S. Agostinho, and 450 leagues from the Cape of Good Hope, in 42° S. This seems to represent the land found by Tristão da Cunha in 1506, but possibly discovered by an earlier expedition.

⁶ See p. 36, Maplets 1-5.

⁷ "It is more than doubtful whether the map seen by Magalhães was actually the work of M. Behaim" (Dr. Wieser, 'Magalhães-Strasse,' 1881, p. 51). The learned Harris, on the other hand, believed that "Behaim doubtless traced hypothetically the celebrated strait which Magellan was destined to discover thirty years after" ('Discovery of North America,' Paris, 1892, p. 438).

extremity of the "Land of the True Cross" might be doubled, just in the same way as Africa had been doubled. Waldseemüller's Globe and Map published in the very year of Behaim's death prove this most conclusively.

This "Caput finis Terrae" of the charts was the goal of the expedition under Vicente Yanez Pinzon and Juan Diaz de Solis which left San Lucar in June, 1508. But disputes between the leaders destroyed its chances of success, and it came back in October, 1509, having advanced no further than a Cape of St. Mary¹ to the north of the estuary of La Plata. The estuary between that cape and the Cabo de S. Antonio has a breadth of 120 sea-miles, and even much further within it cannot be seen across. It seems indeed that Diaz de Solis failed to recognise that he had reached the estuary of one of the largest rivers of the world. In this respect a private expedition fitted out by Don Nuño Manuel, the Controller of the Royal Household (Almotacel mór) and Christóbal de Haro, a merchant prince of Antwerp, at that time established at Lisbon, was more successful. One of the pilots whose vessel arrived on October 12, 1514² at Madeira, on the homeward voyage, gave an account of their discoveries to an agent of the famous Welsers of Augsburg who was stationed there. This account was forthwith printed in Germany as a 'Newe Zeytung auss Presilly (Brazil) Landt.' We thus learn that the two vessels of the expedition doubled a cape in lat. 40°, or one degree beyond the latitude of the Cape of Good Hope (i.e., 35° S.), and sailed up a "gulf" for sixty leagues when a violent storm (pampero) swept them back into the open sea. The pilot expressed a belief that this "gulf" or strait would enable a ship to sail to "Malagua," which he thought was distant only 600 leagues,³ and proposed to make this voyage shortly himself. Who was this "fast friend" of the writer of the 'Newe Zeytung,' whom he refers to as "the most famous of the King of Portugal's pilots?" I believe it was João de Lisboa. Gaspar Correa ('Lendas da India,' t. II., p. 528) credits him with having discovered the Cabo de S. Maria, on the northern shore of the estuary of the La Plata; Magellan's pilots are stated⁴ to have recognised this cape from a description given by

him, and his name is attached, on Diego Ribero's chart (1529), to a cape a little further to the north.

Martin Fernandez d'Enciso, whose 'Suma de Geographia' was printed at Seville in 1519, knew that a river twenty leagues broad entered the sea to the south of that cape, and that the country beyond it was inhabited by man-eaters.

In the meantime news had been received of the discovery of a great "Southern Ocean" on September 25, 1518, by Vasco Nuñez de Balboa,⁵ and Juan Dias de Solis was despatched for a second time with instructions to seek for a strait or to sail round the southern extremity of Brazil, so that he might join hands with the Spanish forces already on the west coast of the New Continent. He started in October, 1515, explored the estuary of the La Plata, and sailed up the Parana, where he lost his life in a skirmish with natives; upon which his faint-hearted companions returned to Europe.

It will thus be seen that when Magellan submitted his scheme to the authorities in Spain, the west coast of South America was known only as far as the estuary of a huge river, then known as Rio de Solis, and subsequently as Rio de la Plata. Magellan's friend Christóbal de Haro, who had left Lisbon for Seville on account of a denial of justice on the part of King Manuel, and who contributed 4,000 ducats towards the expenses of this expedition, naturally communicated to him the results of his own Brazilian venture of 1514. It was permissible at that time, notwithstanding the second voyage of Diaz de Solis, to believe that the estuary discovered might eventually turn out to be connected with a strait leading to the Mar del Sur, and it is almost certain that this hypothetical strait was shown on charts which Magellan was able to consult. At all events, the existence of such a strait was believed in by a German mathematician, Johann Schöner, who, depending solely upon the scant and misunderstood information of the 'Newe Zeytung,' delineates it upon a globe, the gores for which were printed at Nuremberg in 1515.⁶ Schöner's name is not engraved upon this globe, and Magellan, who only left Portugal in 1516, may have seen it there, and ascribed it to Behaim. There may even have existed a map in the King's treasury showing such a "hypothetical" strait. Behaim, however, cannot have been the author, for when the news of the discovery of the La Plata first reached Europe he was already dead.⁷

¹ This cape, judging from the old charts, is identical, not with the modern Cabo de S. Maria, but with the Cabo de Ballena near Maldonado in 35° S.

² The date was discovered by Dr. K. Häbler in the original MS. still preserved in the archives of the Fugger family ('Zeitschrift für Erdkunde,' Berlin, 1895, p. 352). This discovery disposes of many pages of conjecture regarding the date of the expedition.

³ Surely the pilot knew better! The meridian distance between the mouth of the La Plata and Malacca was certainly known to exceed 160°, for it was well known that Malacca, first reached by Lopez de Sequiera, lay within the Portuguese half of the world, or more than 158° to the West of the "Line of Division" as laid down by the Treaty of Tordesillas. Magellan in his 'Memorial of September, 1519,' estimates the meridian distance between the Cabo de S. Maria and Malacca at 177½°. The actual difference between the Line of Division and the Moluccas is 186°. These coveted islands were thus 6° within the Portuguese half.

⁴ Herrera, Doc. II., lib. IX., c. 10; Varnhagen, 'Historia General de Brazil,' 1854, I., p. 30.

⁵ Bernhard Varenus (b. at Hitzacker, 1622, died 1650, at Amsterdam, shortly before the publication of his famous 'Geographia Generalis,' of which Isaac Newton, in 1672, published a revised edition—see Dr. Breusing, in Petermann's Mitth., 1880, p. 136), credits this Balboa with the discovery of Magellan's Strait ('Geogr. gen.,' cc. 12 and 14).

⁶ See Maplet No. 9.

⁷ Antonio Galvão, 'The Discoveries of the World' (London, 1862, p. 66), tells us that D. Pedro, in 1428, brought a chart of the world from Venice upon which the Strait of Magellan was called "The Dragon's Tail" (Cola de Dragon) and the Cape of Good Hope "Fronreira de Africa." See A. Ribeiro dos Santos, "Memoria sobre dois antigos Mappas," 'Memorias de Litteratura Portugueza,' VIII., 1812. This mysterious map has never been discovered and never will be.

XI. BEHAIM AND THE DISCOVERY OF AMERICA.

HAVING thus dealt at some length with the relations which are supposed to have existed between Behaim, Columbus and Magellan, we might proceed to other matters had not a learned professor of the University of Altdorf, near Nuremberg, put forward claims on behalf of his countryman which cannot be passed over in silence, as they have not lacked supporters even down to the present century. In a fulsome eulogy delivered in 1682 in memory of George Frederick Behaim of Schwarzbach,¹ a senator of Nuremberg and benefactor of the University, Prof. J. C. Wagenseil speaks of our Martin as "the prodigy and glory of his age, an incomparable and divine hero, whose achievements, though hitherto ignored, redounded to the credit not only of the city which had given him birth, but of the whole of Germany."² This unprincipled historian ventured to tell his ignorant listeners that their fellow-townsmen, having obtained a vessel from Isabella, the daughter of John I. of Portugal, and widow of Philip the Good (1467), discovered the Azores, and planted a Flemish colony upon Fayal, on which ground these islands became known as the "Flemish Islands";³ that subsequently, roving the Atlantic, he examined (*pervestigavit*) the islands of America and the strait now called after Magellan, of which explorations he made a map which he presented to the King of Portugal, and that he did all this before Columbus and Magellan, whose fame was proclaimed by every mouth, whilst Martin Behaim, the real discoverer, was ignored. In support of these astounding "revelations" Wagenseil refers to authorities which on closer examination do not in the least justify his assertions. The account of Behaim's voyage along the West Coast of Africa in Schedel's '*Liber Chronicorum*'⁴ is quoted by him as if it formed an integral part of the '*Historia de Europa sub Frederico III.*' of Aeneas Sylvio, better known as Pope Pius II.,⁵ and not as an interpolation by a later editor of that work. In the '*Liber Chronicorum*' it is stated that after Cão and Behaim had crossed the Equator they found themselves in another world—alterum or alium orbem—hitherto not known to us. Wagenseil rashly jumped to the conclusion that this

"alter orbis" could be no other than the "mundus novus," or America, the existence of which was absolutely unknown to the editor of the '*Chronicle*,' who obviously refers to a hypothetical fourth part of the world, the "alter orbis" of Pomponius Mela,⁶ inaccessible to us owing to the heat, and supposed to be the home of fabled Autochthones.

Wagenseil next refers to Riccioli's⁷ '*Geographia et Hydrographia reformata*,' lib. III., c. 22, where it is merely stated that Columbus was indebted for his great discovery "either to his own genius, as he was a man learned in astronomy, cosmography and physics, or to information (*indicia*) given by Martin Boherne, or, as is said by the Spaniards, by Alphonso Sanchez of Huelva."⁸ He also quotes Joannes Matalius⁹ as an authority, but that learned Frenchman, in the notes accompanying his American collection of maps,¹⁰ merely refers to Behaim's chart supposed to have been seen by Magellan in the King's treasury. Wagenseil further hints at verbal statements alleged to have been made by Behaim's son when he visited his relatives at Nuremberg, and refers to the family archives, where he saw a portrait and the famous globe, which he assures his readers has delineated upon it many nameless islands "scattered over the broad waters of the ocean," and belonging to America. Apparently, as trumps, he points to two MS. volumes in the Town Library as confirming his assertions. These codices have been carefully examined by Ghillany, p. 50, and also by myself, and their worthlessness as documentary evidence is obvious at the first glance. The first of these MSS., entitled '*Patricii reipublicae Norimbergis*,' is a compilation of no authority, evidently got up for the glorification of eighty-three patrician families who ruled the imperial city. All it says about Martin Behaim is that "he was a famous knight, who navigated in India, and discovered new islands." The second MS. is described as '*Annales Norimbergensium*.' It is a compilation made by order of the Senate by Johann Müllner, town clerk from 1602 to his death in 1684, and contains a history of the town up to the year 1620. It says,¹¹ "In the time of the Emperor Charles V. (sic!) there lived Martin Behaim, the son of Martin Behaim and of Agnes, the daughter of Wilhelm Schopper. He was a famous and experienced Mathematician and Astronomer, and with the aid of such art,

⁶ Pomponius Mela, a native of Spain, wrote his compendium treatise on Geography, '*De Situ Orbis*,' A.D. 43.

⁷ Job. Baptist Riccioli, S.J., was born at Ferrara in 1598 and died in 1671. His '*Geographia*' was published at Bologna, 1661.

⁸ A good summary of the story of this pilot, first referred to by Las Casas, who heard it in Española (Cuba) in 1502, and whose name is first mentioned by Garcilasso de la Vega, who says he had the story from his father, is to be found in J. B. Thatcher's '*Christopher Columbus*,' I., pp. 305-347 (New York, 1903).

⁹ Jean Matal (J. Matalius Metellus Sequanus, i.e., the Burgundian) was born at Poligni in the Franche-Comté in 1520, and died at Augsburg (where he had been living since 1555) in 1597.

¹⁰ '*America a. novus orbis tabulis aeneis secundum rationes geographicas delineatus*,' Baa., 1555, ed. sec. Colon. Agrip., 1600.

¹¹ T. I., fol. 485 of the MS., which I consulted in the Town Library. Wagenseil quotes t. I., fol. 885 or 285; Ghillany, p. 632.

¹ For his biography, see F. C. Hagen, '*Memoriae Philosophorum*,' etc., Bairuth, 1710, pp. 209-261.

² '*Sacra parentalia D. Georgii Fredericii Behaimi de Schwarzbach*,' Altdorf, 1682, p. 16. The substance is repeated in a popular '*Pera Librorum Juvenilium: Synopsis Historiae Universalis*,' P. III., p. 527, Norimb., 1695. Those passages of the '*Parentalia*' which refer to Martin Behaim are reproduced by Ghillany, p. 43, whilst Murr, p. 74, reprints the corresponding passages from the '*Pera*.'

³ The notes accompanying Ludovicus Teisera's Map of the Azores in the '*Theatrum orbis*' of Ortelius, 1584, informs the reader that these islands were discovered by merchants of Bruges.

⁴ For full translation of this passage see p. 25.

⁵ See p. 33.

sailing from Spain, he discovered several islands, previously unknown, wherefor he was knighted by the Emperor, who also testified that of all citizens of the Empire he was the traveller who had gone furthest.¹ He settled and married in such islands, and had heirs, and presented the Town Council with the *Globum terrestrum* which until recently stood in one of the upper reception rooms² of the Town Hall."

Wagenseil, who was a man of learning, must have been fully aware of the utter untrustworthiness of his authorities, and we might treat his servile adulatory address with contempt had not his assertions been accepted by authors of some repute, though little judgment, even down to the beginning of this twentieth century.

Nurembergers naturally were the first to follow up the false lead of their townsman Wagenseil. Magnus David Omeis in 'De claris quibusdam Norimbergensibus' (Norimb., 1683, p. 23), Johann Wülfer, Professor at the Aegidian Gymnasium, in his 'Oratio de majoribus oceani insulis' (Norimb., 1691, pp. 98-102), Joh. Phil. von Wurzelbau (b. 1651 at Nuremberg, d. 1752) in the dedicatory epistle to his 'Vranies Noricae basis astronomico-geographico' (Norimb., 1697); Christian Cellarius (b. 1688, d. 1707, Professor of History at Halle) in his 'Historia medii aevi' (Jena, 1698, p. 214) and F. C. Hagen in 'Memoriae Philosophorum' (Bairuth, 1710, p. 221), these all blindly accept Wagenseil as their guide. Prof. J. F. Stüven, of Giessen, in his 'Dissertatio de vero novi orbis inventore' (Francof., 1704, cc. 5, 6), which he is bold enough to call a "dissertatio historica critica," claims on behalf of his "godlike hero" that he discovered the Azores and America as far south as Magellan Strait, that he depicted his discoveries upon a chart which he presented to King Alfonso (who died 1481!), and that Colon and Magellan saw this chart. "The glory of having been the first to discover America is due to Martin Behaim, and from this source Columbus derived a better knowledge of the route he had to follow; but be the credit due to Behaim or to Columbus, they both were great navigators (navarchi), of lofty spirit, and that which was happily begun by the one was carried to a happy end by the other." Stüven suggests that the chart which D. Pedro is reported to have brought from Venice in 1428 was in reality the work of Behaim, whom he does not hesitate to identify with Juan Sanchez, of Huelva, the pilot reported to have died in the house of Columbus!

Michael Friedrich Lochner, the learned physician, in his 'Commentarium de Ananasa' (Norimb., 1716) follows Wagenseil, and suggests that America ought to have been named "Occidental Bohemia"; E. D. Hauber, the author of a 'Versuch einer Historie der Land-Charten' (Ulm,

1724), is content to quote Wagenseil and Stüven. Even J. C. Doppelmayr, to whom we are indebted for the first "facsimile" of Behaim's globe, followed the misleading authorities mentioned above, when writing the biography in his 'Historische Nachrichten von den Nürnbergischen Mathematicis und Künstlern' (Nürnberg., 1780). Nor is a single new fact put forward or blunder removed by G. A. Will, who, in the 'Nürnbergisches Gelehrten Lexikon' (Nürnberg., I., 1755), bestows upon his hero the title of "thalastus," and thinks that America and Magellan's Strait ought by rights to have been named "Western Behaimia" and "Behaim Strait"; by J. S. Moerl, in his 'Oratio de meritis Norimbergensium in Geographiam,' or J. S. Fürer in an 'Oratio de Martino Behaimo,' both of which orations may be found in the 'Museum Noricorum' published at Altdorf in 1759.

Prof. Geo. Christian Gebauer was the first to challenge, in his 'Geschichte von Portugal' (Leipzig, 1759, I., p. 125), these extravagant claims put forward by ignorance or sycophancy on behalf of Martin Behaim. Prof. Eobald Tozen of Göttingen still more vigorously defended the claims of Columbus, as "the true and first discoverer of the New World, against the unfounded claims put forth on behalf of Vespucci and Martin Behaim."³ The publication of Murr's 'Diplomatische Geschichte' in 1778 ought entirely to have put a stop to all speculations as to a discovery of the New World by Behaim, prior to Columbus.⁴ It failed so to do. On April 1, 1786, "ignorant and presumptuous" Otto, as Harisse⁵ calls him, addressed a letter and Memoir to John Franklin, in which Behaim is credited with the discovery and colonisation of Fayal in 1460, and of Western America from Guyana (St. Brandan's island of his globe) southward as far as the strait of Patagonia in 1484. His knighthood, bestowed in 1485, was the reward of these achievements.⁶ It was easy to refute these astounding propositions. The Count Giovanni Rinaldo Carli⁷ did so in a letter published in 1792 in 'Opusculi scelti sulle scienze e sulle arti' (t. XV., pp. 73-97); Christóbal Cladera in 'Investigaciones historicas' (Madrid, 1794). Both these authors were of course acquainted with the work of Murr, of which the latter gives a translation. Since then no writer of weight has ventured to claim Behaim as a "forerunner" of Columbus,⁸ though

³ 'Der wahre und erste Entdecker der neuen Welt, Christopher Colon, gegen die unbegründeten Ansprüche welche A. Vespucci und M. Behaim auf diese Ehre machen vertheidigt,' Göttingen, 1761. This essay was first printed in the 'Hannoversche Beyträge.'

⁴ Apart, of course, from the discoveries made by the Northmen, which had been forgotten in the fifteenth century.

⁵ 'Bibl. Amer. vestutissima,' 1866, p. 38.

⁶ 'Transactions of the American Philosophic Society held in Philadelphia,' II. (Philad., II., 1726), pp. 263-284. A translation in 'Archives Littéraires de l'Europe,' 1805, May and June.

⁷ Count Giovanni Rinaldo Carli was born at Capo d'Istria, 1720, was Professor of Astronomy and Naval Science at Venice, 1741-49, and died 1795. A first edition of his 'Opusculi scelti' was published in 1778.

⁸ Löher, 'Geschichte der Deutschen in Amerika' (Cincinnati., 1847), is one of the last to do so.

¹ Wagenseil's rendering of the Emperor's remarks ('Synopsis historiae universalis, III., p. 529) reads as follows: "Martino Bohemo nemo unus Imperii civium magis unquam peregrinator fuit magisque remotas orbis aditv regiones."

² Regimentsstuben. These were the reception or state rooms on the upper floor of the Town Hall, where works of art and curiosities were exhibited (E. Mummenhof, 'Das Rathaus in Nuremberg').

A. Ziegler¹ would have us look upon him as the "intellectual" discoverer of the continent. Ghillany (p. 63) thinks it not impossible that he may be the actual discoverer of the strait called Magellan, whilst the Rev. Mytton Maury,² after a very superficial study of the authorities, assures us that "taking all the evidence into consideration it would seem that the facts in the case not simply allow, but compel us, to regard Martin Behaim as the original discoverer of the strait." One of the last to support the claims made in that respect on behalf of Behaim is U. Griffoni,³ but his arguments were speedily refuted by Prof. Carlo Errara of Turin and Prof. Gustavo Uzielli of Florence.⁴

Weighing carefully the available evidence bearing upon the relations between Behaim, Columbus and Magellan, and the discovery of the New World, I feel justified in the following conclusions:

1. Behaim most certainly did not discover, or ever claim to have discovered, the New World, nor did he exercise any influence upon the projects of Columbus, whom he had very few opportunities of knowing, but, to judge from his globe, he shared the erroneous opinions of the famous navigator as to the small breadth of the Atlantic Ocean.

2. Behaim may have joined Fernão Dulmo and João Affonso do Estreito in the scheme for an expedition proposed for 1487, but if this expedition ever started it seems to have yielded no results, as no reference whatever is made to it in the legends covering Behaim's globe.

3. There exists no evidence whatever that Behaim, between the years 1494 and 1507 joined any of the Portuguese expeditions which visited the west coast of South America.

4. If Magellan had a chart showing a strait connecting the Atlantic and the Mar del Sur, it cannot have been the work of Behaim, at whose death the coast was known only to the Rio de Cananea, 750 miles to the north of the estuary of the La Plata, which was first mistaken for such a strait.

XII. A VISIT TO NUREMBERG, 1490-93.

Object of the Visit.

In the spring of 1490 Martin Behaim left his island home on a visit to his native town of Nuremberg, where he arrived in the summer of the same year. After an absence of seven years he may well have desired to revisit the scenes

of his youth and to see his relatives, but the immediate object of his journey was of a business nature. His mother having died in 1487, the time had arrived for a distribution of her estate among the heirs.

During his long stay at Nuremberg, Martin was the guest of his cousin Michael, the son of his uncle Leonhard, and *Senior Familiae*, who lived in the Zistelgasse.⁵

Business Transactions.

Legal steps in connection with the realization of the estate and its distribution appear to have been taken without loss of time, for on August 9, 1490, the legatees appeared before the court charged with testamentary business. Three brothers, Martin, Stephen and Michael, and the sister, Ursula, the wife of Ulrich Futterer, appeared personally, whilst Wolfrath, who was absent at Lyon, was represented by attorney.⁶ On this occasion the distribution of the personal effects of the parents, including pearls and jewellery, was effected.

On the Wednesday after Ladyday, 1491 (March 30), Martin, on receipt of 800 gulden, surrendered his share in his father's house in the market-square.

On May 2, 1491, Ortolf Stromayr or Stromer purchased a house "unter der Vesten" (below the castle) which Martin's father had inherited in 1435, and which stood next to a house inhabited from 1427 to 1502 by the father of Albrecht Dürer, the famous artist. Stromayr paid 1050 gulden for this house, and Martin's share—210 gulden—was paid to him forthwith.

On August 5, 1491, the feuds of the family outside Nuremberg were dealt with. They included estates at Rückersdorf (near Lauf on the Pegnitz) and Kurssendorf (now Kurzenbach, to the south of Onolzbach or Ansbach), and a farm, Katenbach, near this town. As Behaim intended to live abroad he accepted 83 gulden in lieu of his claims to these feuds. Finally, on August 17 he was paid 126 gulden as his share of a house "unter den Fleischbänken"—the Flesher's row—which had been sold to Endres Flock. Martin's share from the sale of his mother's real estate thus amounted to 1219 gulden Rhenish or about £600, and if we add to this his share of the personal estate, a report current in Fayal that he returned from this visit to Germany with "great riches" had some foundation in fact.⁷

But whilst Martin's legal proceedings in connection with his heirship were no doubt of a pleasant nature, he

⁵ Now known as Dürer Strasse. Leonhard's house still exists and bears the number 4.

⁶ Copies of the documents referring to these testamentary proceedings are to be found in Dr. G. W. K. Lochner's 'Selecta Archivalia Norimbergensis,' a MS. in the town library. Dr. S. Günther has published extracts from them. I have since examined the originals, and am able in a few instances to correct and even to supplement the information given by Dr. S. Günther. Dr. Lochner was born in 1798. He was the keeper of the town archives, 1865-82, when he died ('Mitt. des Vereins f. d. Geschichte d. Stadt N.,' V., 1854).

⁷ Fructuoso, lib. IV., c. 3, § 83.

¹ A. Ziegler, 'M. Behaim der geistige Entdecker Amerika's' (Dresden, 1859).

² Mytton Maury, 'On Martin Behaim's Globe,' read March 19, 1872 (Journal American Geographical Society of New York, IV., 1874, pp. 432-452).

³ 'Revista Marittima,' 1901, October.

⁴ 'Rev. geografica Italiana,' 1902, pp. 382 and 457.

was troubled, at the same time, with claims for the payment of debts incurred by him before his departure for Portugal. His brother Stephen had paid, on February 13, 1489, the 168 gulden which, ever since 1484, he owed to his uncle Leonhard Hirschvogel and to Niklas Schlewitz, and had to be indemnified.¹

Other liabilities were disposed of on December 13, 1490, and February 2, 1491. On the former date Martin was adjudged to pay Hermann Zwaypfund for 70 lbs. of lidlons (nails?), which had been supplied to him; on the latter he paid off a bond debt of 48 gulden, which he owed to Heinrich Zimmer, who had transferred it to Catherine, the widow of Hans Behaim the stonemason, and for which his brother Michael had become security.²

Behaim's Globe.

There were no doubt other transactions of a financial or legal nature, of which no record has been preserved, but we are pretty safe in assuming that the business which had brought Martin Behaim to Nuremberg had been satisfactorily settled by the end of August 1491. He might therefore have departed for his distant island home at once, but it pleased him to extend the duration of his visit for another couple of years. It is to this extension of his visit that we are indebted for the famous globe. Behaim no doubt interested his fellow-townsmen by the account he gave of his life in the far-off Azores and during a voyage to Guinea. The merchants of the Imperial city had their "Inn" or "fondaco" at Venice and were fairly well acquainted with the trade of the Levant; numbers among them had visited Egypt and the Holy Land,³ but their knowledge of Portugal and of the African discoveries made by the Portuguese was still somewhat vague. But not only merchants and craftsmen, desirous of discovering new fields for their enterprise, may be supposed to have listened with interest to the tales of the young traveller staying amongst them; men of learning are known to have done so likewise. We know at all events that Hartmann Schedel, the author of the Chronicle, accepted from him and printed an account of his voyage, and that Dr. H. Müntzer or Monetarius furnished him with a letter of recommendation to King John, which is printed in the Appendix. Other "shining lights" of the Nuremberg of those days—Bernhardt Walther (b. 1430, d. 1504), the friend and pupil of Regiomontanus, whose library he bought, Sebald Schreyer, the antiquary (see p. 6), and the youthful astronomer Johann Werner (b. 1468, d. 1528), and even visitors like Conrad Celtes or Pickel (p. 2)—may be presumed to have had personal intercourse with Martin Behaim, although his name is not mentioned once in any of their published writings. Nor can it be doubted that Martin Behaim was introduced to

the Emperor Maximilian, who arrived at Nuremberg on March 15, 1491, to preside over a Reichstag, gave two balls to the Patricians in the Townhall on June 14 and 27, and organised other festivities.⁴ It was probably on one of these occasions that he said 'Martino Bohemo nemo unus imperii civium magis umquam peregrinator fuit, magisque remotas orbis adivit regiones,'⁵ which was perfectly true at the time when it is supposed to have been spoken.

It was, however, a member of the Town Council, George Holzschuher,⁶ to whom Martin Behaim became indebted for the greater part of the fame which he still enjoys. George Holzschuher in 1470 had visited Egypt and the Holy Land, and he evidently took some interest in the progress of geographical discoveries. It was he who suggested to his colleagues of the *Rat* that Behaim should be requested to undertake the making of a globe, upon which the recent discoveries of the Portuguese should be delineated. His suggestion was accepted, and to him we are indebted for the famous globe, a full account of which I shall give in the second part of this work.

Martin Behaim's Family Relations.

But whatever popularity Martin Behaim may have enjoyed among his fellow townsmen, he certainly does not appear to have secured the affections of his own kith and kin. We have already learnt that Martin, when first he came to Nuremberg, became the guest of his cousin Michael, the son of his uncle Leonhard. His reception, at first, may have been cordial enough, but his prolonged stay and idleness proved irksome in the end. This at least we gather from two letters which his brother Wolf, who was at the time at Lyon, wrote to his cousin Michael. In the first of these letters,⁷ written on November 22, 1491, Wolf says:—

"Moreover, you let me know that my brother Martin is still at Nuremberg, and in your house, and that his conduct is singular (seltzams wesen). I am sorry to hear this. Here at Lyon they say things about him which make me ashamed. I should be very glad if we were rid of him altogether."

From a subsequent letter⁸ dated December 5, 1492, we learn that "Martin does nothing in particular, but goes daily into the garden, and only concerns himself with the garden," adding that if he took such an interest in plants he might at least set up as a dealer in herbs. Ghillany suggests that the Nurembergers expected Martin to work all day in a merchant's office, or took offence at his gay southern dress. On this latter point, however, we know nothing. Martin may not have worn

⁴ Mummenhof, 'Mitt. d. Vereins f. d. Gesch. d. Stadt N.,' V., 1884, p. 167.

⁵ See p. 40.

⁶ 'Biedermann Geschlechtsregister,' Tafel 182. George was a member of the town council from 1484-1514, and died 1526. (See also p. 1.)

⁷ Ghillany, p. 105.

⁸ Ghillany, p. 106; Gunther, p. 72.

¹ See p. 10.

² Lochner I., pp. 3, 13; Günther, notes 88 and 89.

³ R. Röhrich, 'Deutsche Pilgerreisen,' New edition, Innsbruck, 1900.

gay clothes at all; and judging from his portrait, which shows him with hair hanging down to the shoulders and clean-shaven, he certainly had not adopted the Portuguese practice of cutting the hair short and allowing the beard to grow. Dr. Günther (p. 85) speaks of the Nurembergers of that age as being in a measure narrow-minded (*spießbürgerlich*),¹ most punctilious in the fulfilment of the duties of their rank and calling, but out of sympathy with a man of the type of a Martin Behaim, and with views of life which did not accord in every respect with their own. Dr. Günther, I believe, is unjust to the inhabitants of his native town. Conrad Celtes, who had a good knowledge of the town, and who certainly was neither a bigot nor a saint, admits that the inhabitants were keen business men, but at the same time credits them with qualities which are not reconcilable with narrow-mindedness. As to myself I agree with W. M. Thackeray when he protests against the theory "that men of letters, and what is called genius, are to be exempt from the prose duties of this daily, bread-wanting, tax-paying life, and are not to be made to work and pay like their neighbours."

But whatever the relations between Martin and his kinsmen, he must have felt very comfortable at Nuremberg, or he would not have lingered there long beyond the time needed for the settlement of his legal business and the production of his globe, seemingly forgetful that he had left a wife in Fayal who may have been anxiously looking forward to his return.

Departure.

At length, in July 1498, and after a stay of nearly three years, Martin Behaim left Nuremberg, carrying with him not only his "goods," but also a letter of his friend Dr. H. Monetarius to King John of Portugal, in which he directs the King's attention to the bearer as a person well qualified to be employed in an exploring voyage to the west.²

XIII. A MISSION TO FLANDERS, 1493.

Flanders in 1493, Perkin Warbeck.

MARTIN BEHAIM had hardly returned to Portugal with all his "goods" when he went forth again to Flanders, chiefly no doubt for the purpose of collecting the money which was owing to his father-in-law for sugar, but also, as he asserts, on a secret mission to the "King's son" which King John had confided to him. All we know about this

mission we learn from a poorly indited letter which Behaim wrote to his cousin Michael (Appendix X.). No Portuguese author refers to such a mission, and no document referring to it has ever been discovered, but such a mission might well have been confided to this foreigner if King John in a letter written by his own hand had really told him "*quia perspecta nobis iam diu integritas tua nos inducit ad credendum, quod ubi tu es est persona nostra*"—that is, "We are induced to trust thee because we have been aware for a long time of thy well-known integrity, and where thou art, there is our own person!" Murr (p. 114) quotes this passage merely as a "family tradition," and thinks it incredible that the King should have written in this strain, and I quite agree with him.

At the time of this supposed "mission" Archduke Philip, son of Maximilian, the King of the Romans, resided at Mechlin. He was then only sixteen years of age, and government was carried on by a Council of State, influenced not only by Maximilian, but also by the Duchess Margareta of York, a sister of the Yorkist King Edward IV. of England, and since 1477 widow of Duke Charles of Burgundy, both of whom were intensely hostile to Henry VII. of the House of Tudor; Maximilian because he felt that Henry VII., his former ally, had faithlessly deserted him by signing a separate treaty of peace with Charles VIII. of France at Étapes on November 3, 1493; Margaret as the staunch supporter of Perkin Warbeck, who claimed to be a son of Edward IV. falsely reported to have been murdered in the Tower by his uncle Richard III., and therefore the legitimate King of England. When this impostor, the "Young King of England," as Behaim calls him, was expelled from France in November 1492, he found a refuge with this Dowager Duchess of Burgundy, who hailed him as the "White" (Yorkist) rose of England, and embraced him as if he were really her nephew. Maximilian, who first saw Perkin at Vienna in the autumn of 1493, countenanced this imposture and trusted to his promise that, once seated upon the throne of England, he would stand by him in his wars with France. Perkin returned to Flanders with Maximilian in the summer of 1494, and was present at the festivities held at Mechlin on August 21, and subsequently at Antwerp and elsewhere, in celebration of his son's accession to the throne of Burgundy. Henry VII., in July 1493, not unnaturally remonstrated against the countenance given to this impostor at the court of Burgundy, and when Philip's council declined to interfere, he, in November, expelled all Flemings from England. Upon this Philip retaliated by expelling the English, and all trade between the two countries was stopped until April 1496, when Perkin was disavowed by Philip.³

¹ *Spießbürger*, lit. "pikeman," a term of contempt applied to narrow-minded citizens or city dwellers.

² The letter is printed, Appendix IX., p. 113.

³ Perkin Warbeck, aided financially by Maximilian, first invaded England and Ireland in 1496. He was hanged at Tyburn in 1499 (J. Gairdner, 'The Houses of Lancaster and York,' London, 1887).

It will thus be seen that at the time of Behaim's supposed mission there were present in Flanders only the young Archduke Philip and Margaret, Dowager Duchess of Burgundy. Maximilian had left Flanders immediately after the signing of the Treaty of Senlis (May 23, 1493), and only returned in August 1494, after his marriage with Blanca Maria Sforza, which was celebrated at Innsbruck on March 16, 1494. Perkin Warbeck, the "Young King of England," was absent likewise and only returned with Maximilian. All this must have been perfectly well known at Lisbon, for Diogo Fernandes Correa, the King's factor at Antwerp and a cavalier of his household, was a trusted servant whose reports were forwarded at regular intervals.

Behaim's Account of his Mission.

I now turn to Behaim's own account of his "mission." He left Lisbon towards the close of 1493, and when on the high sea his vessel was captured, as a suspected blockade-runner, by an English cruiser, and he was carried to England. There he fell ill with fever, and twice he held a lighted taper in his hand, in the expectation of death. After his recovery and a detention of three months, he bribed a French "sea-robber" to carry him into France, and ultimately, in March 1494, he arrived at Antwerp. In the letter which he wrote there, on March 11, 1494, to his cousin Michael he mentions "the King's son" (Archduke Philip), the young King of England (Perkin Warbeck), and "the King of the Romans" (Maximilian). One of the objects of his journey, he tells us, was to collect the money owing for sugar to his father-in-law, but about his "mission" he leaves us in complete ignorance.

In a postscript we are told that he was obliged to hurry back to Portugal, where he arrived safely, and tells his friends that they would hear more about him from Doctor Jeronimus (Monetarius or Müntzer). As Monetarius was still at Nuremberg at that time (he only arrived at Lisbon at the end of November 1494), Dr. Scheppig suggests to me that Behaim refers to a letter which he had written to that learned physician, a letter long since lost.

Behaim's Account examined.

Can we wonder that a meagre account such as this, not supported by a single historian, has led to numerous conjectures?

Cardinal Saraiva¹ declares that it is most unlikely that Behaim was entrusted with such a mission, and that this is only "one of his impostures, so that in his native country he might be looked upon not only as a great discoverer but also as a wise diplomat, enjoying the thorough confidence of the King of Portugal."

¹ 'Obras completas' (Lisbon, 1875), V., p. 194.

D. Jorge, the son of King John II.

Murr (p. 119) identified the "King's son" mentioned by Behaim with Don Jorge, the illegitimate son of King John.

In 1491 the King lost his only legitimate son, Affonso, who was thrown by his horse and killed only a few months after his nuptials with Princess Isabel of Castile had been celebrated with great splendour at Santarem. In consequence of this sad accident D. Manuel (born 1469), the brother of Queen Lianor² and of D. Diogo, Duke of Viseu, whom King John had killed with his own hand at Setubal, on August 28, 1484, as the head of an aristocratic conspiracy which aimed at the life of the popular monarch, became heir-apparent. King John, after this act of justice, is reported to have shown much affection toward young D. Manuel (whom he created Duke of Beja), but it was well known that, having no children by his unloved consort, he would have preferred to have been succeeded on the throne by his illegitimate son D. Jorge, born in 1481 by D. Anna de Mendonça, a lady of noble birth and exceptional beauty. This youth had been placed in charge of the infanta Joanna,³ the King's maiden sister, and when this lady died, in 1490, he was brought to the Royal court, with the Queen's consent, and brought up as his son. In 1492, notwithstanding his youth, he was with the Pope's consent installed master of the Order of Santiago and d'Aviz, D. Diogo d'Almeida, a nobleman of high standing, was appointed his Governor (aio) and Controller of the Household (governador da casa), whilst Cataldo de Aquila, a learned Sicilian whose 'Epistola' were printed at Lisbon in 1500, became his tutor.

The King was much attached to his illegitimate offspring, and desired to have him legitimised and appointed his successor. The Queen, however, strongly objected to a proposal which would have deprived her own brother of his birthright. She was deaf to her husband's entreaties, and even his threats failed to move her.⁴

The Pope, Alexander VI., a Spaniard, one of the most infamous wearers of the tiara, proved equally obdurate. King Affonso in 1475 had been permitted to marry his niece; King Manuel subsequently married his deceased wife's sister; Louis XII. was divorced in order that he might marry the widow of Charles VIII. and heiress of Brittany, but the legitimisation asked for would have given offence to Queen Isabella of Castile, and this was sufficient reason for refusing a dispensation. When King

² Queen Lianor was a daughter of D. Ferdinand, Duke of Viseu.

³ Joanna, the infanta, was born in 1454, was betrothed to Henry IV. of Castile, but died in a convent at Aveiro in 1490.

⁴ See Buy de Pina, c. 51; Resende, c. 133. Peter Martyr, 'Opus Epistolarum,' refers to the disputes between the King and his Queen, and so does D. Augustin Manuel y Vasconcelos, 'Vida y acciones de Rey D. Juan II.' (Madrid, 1639), but they do not mention Behaim, as has been asserted.

John made his last will and testament at Alcaçovas on September 29, 1495, only a month before his death, he named D. Manuel as his successor, for it had no doubt been pointed out to him by his advisers that his doing otherwise would in all probability lead to civil war, and he was reminded of the motto, chosen by himself: "Pela Lei e Pela Grei."

As to a "mission" being sent to D. Jorge, Mendo Trigozo (*loc. cit.* p. 383) already points out that this prince is not known ever to have visited Flanders. As a matter of fact, whilst Behaim was in Flanders, the young prince, at that time a lad of thirteen, was quietly living at the King's Court, in charge of his tutor Cataldo de Aquila, and there, in November 1494, Dr. Monetarius met him.¹

Maximilian, the King of the Romans, and his son Philip.

Mendo Trigozo,² whom I have just now referred to, is of opinion that the mission was intended for Maximilian, King of the Romans, and that it was the object of the mission to secure Maximilian's influence in favour of King John's desire to legitimate his son D. Jorge. King John certainly had some claim upon the gratitude and good services of this prince. In 1488, when news arrived in Portugal that the citizens of Brügge had made a prisoner of Maximilian, and even threatened his life, the court not only went into mourning, but Duarte Galvão, of the King's council, was at once despatched and authorised to expend 100,000 cruzados on his behalf.³ A few years afterwards, about 1492, the King's factor at Antwerp, Diogo Fernandez Correa, without first having obtained the authority of the King, handed to Maximilian 30,000 cruzados more, to enable him to pay his soldiery. The King, on being informed, not only approved of this act, but awarded his factor a thousand cruzados for having acted so promptly. The ever impecunious King of the Romans certainly enjoyed the favours of his Portuguese relations.

We should do Maximilian an injustice if we assumed that he would not have promptly responded to any reasonable request of his benefactor and cousin, and looked upon a request that he should assent to the legitimization of D. Jorge as immoderate. Such an act would certainly have diminished Maximilian's chance of ever wearing the crown of Portugal, but that chance was small, for although D. Manuel, the legal heir, and himself were both grandsons of King D. Duarte,⁴ he was so only in the female line, whilst the crown descended through

the male line. I have already stated that Maximilian was not in Flanders when Behaim arrived at Antwerp and only reached Mechlin five months after Behaim had started on his journey home. Nor can Maximilian be described as the "King's son," for his father, the Emperor Frederick III., was already dead.

That title, however, belongs rightly to Philip, the son of Maximilian, and it may have been this prince to whom Behaim was sent by King John. Ghillany and others point out that Behaim's selection, as a German, was peculiarly suitable, as he was personally known to Maximilian, who had seen him at Nuremberg, in 1491, and had resided for several years in the Low Countries. But be this as it may, the time for such a mission was certainly ill-chosen, for Maximilian was still far away, whilst Philip, a mere boy,⁵ had not as yet assumed, even nominally, the government of the Low Countries.

Conclusion.

There can be no doubt, as far as I can see, that the principal if not only object of Behaim's visit to the Low Countries, was to collect the money due to his father-in-law for sugar.⁶ The King, hearing of his proposed journey, may have asked him to communicate to him, on his return, information on the condition of the Low Countries likely to interest him. He may thus have been desirous of learning something about Perkin Warbeck, who lived at the Court of Burgundy, whose claims were supported by the Dowager Duchess not only, but also by Maximilian, and whom Behaim actually refers to as the "young King of England." Can we suppose that the sympathies of John II. were with the House of York, as had been those of his father, Afonso V.?⁷ Behaim's sudden return to Portugal may, of course, have been due to King John having changed his mind with reference to D. Jorge, but all this is mere conjecture, and until a document shall be discovered to prove the contrary I shall refuse to believe that King John employed on a delicate diplomatic mission a commercial agent engaged in collecting debts owing to his principal.⁸

⁵ He was born in 1477.

⁶ Rombout de Doppere's Chronicle of Bruges for the year 1494, quoted by Dr. Mees, bears this out, for he tells us that Hurter of Bruges was the first to cultivate Madeira, which he called New Flanders, and the first to import the wines of that island, as also sugar, to Bruges. The old Chronicle mistakes Fayal, or New Flanders, for Madeira, which alone yielded sugar and wine, and where Hurter's wife had an estate.

⁷ In 1482 King John had sent Ruy de Sousa, Dr. João de Elvas and Fernão de Pina, a secretary, as an embassy to the Yorkist King Edward IV. of England to renew the old bonds of friendship (Ruy de Pina, c. 7).

⁸ Ghillany, p. 75, suggests that Behaim left immediately after the arrival of Maximilian in the Netherlands with an errand for King John. But Maximilian only arrived in August, months after Behaim must have reached Lisbon, where he proposed to stay until Whitsuntide, or May 13. General Wauverman's astounding views as to the object of Behaim's mission ('Histoire de l'école cartographique Belge,' Brussels, 1895, I., p. 209) are as follows. King John consulted Behaim on the best method of

¹ D. Jorge was born in 1481; he was created Duke of Coimbra in 1500, and married D. Beatriz de Vilhena, a granddaughter of D. Rodrigo de Mello, Conde de Olivença (Goes, 'Chronicle Rei D. Emanuel I.,' c. 45).

² S. Gunther, p. 45, shares Trigozo's view, whilst Ghillany, p. 74, suggests Philip, the son of Maximilian.

³ Ruy de Pina, c. 32; Resende, c. 72.

⁴ Maximilian's mother, the wife of the Emperor Frederick III., was D. Leonor, the only daughter of King D. Duarte; D. Manuel was the son of D. Ferdinand, the grandson of D. Duarte.

XIV. FAYAL AND THE AZORES.¹

The Discovery of the Azores.

THE discoverers of the Azores are not known to history. They may have been Vikings or Crusaders coming from the north on their way to the Mediterranean; Catalans, Genoese or Venetians driven out of their course whilst making for Flanders, England or Ireland. They certainly were not Portuguese. Prince Henry seems first to have seen these islands upon a chart which his far-travelled brother, D. Pedro, brought from Venice in 1428.²

This, however, is not the oldest available chart upon which the Western Islands are delineated, for they may already be seen upon one designed by a Genoese, in 1351, which is preserved in the Biblioteca Laurenziana at Florence.³

Even more ancient is a list of the islands in the account of an imaginary journey through all parts of the world which was compiled by a Spanish friar before the middle of the fourteenth century, which he entitled '*Libro del conocimiento de todos los Reinos y Señorios*.'⁴

Prince Henry, in 1481, despatched Gonçalo Velho Cabral⁵ in search of these lost islands. Velho in that year discovered the Formigos or "ants," a group of low rocks lying between the islands of S. Maria and S. Miguel, either of which must have been distinctly visible from these rocks.

The second group of the Archipelago, including five islands, may have been discovered by Diogo de Sevilla, pilot of the King of Portugal, in 1487. Such at least is the statement in a beautiful map of the world by Gabriel de Valsequa, a Majorcan cartographer.⁶ This map is

disposing of the spices and other products of the countries he had discovered, and which had hitherto been distributed by Venice. Behaim had first visited D. Jorge, who was then in England, came to Antwerp and Brügge, and recognising the advantages of the former, advised the King to establish a factory there, which was actually done in 1503.

¹ J. Mees, '*Hist. de la découverte des îles Açores*' (Ghent, 1901); P. J. Bandet, '*Beschryving van de Azorische eilanden*' (Antwerp, 1879).

² D. Pedro, Duke of Coimbra, son of John I., was born in 1391. He was regent of the kingdom during the minority of his nephew, Afonso V., 1433-49, when he was killed at the battle of Alfarrobeira. His children fled to the Court of the Duke of Burgundy. On this chart see p. 40, note.

³ Facsimiles of this Portolano chart, also known as the 'Medicean Portolano,' because included in a library founded by the Medici, have been published by Theob. Fischer and A. E. Nordenskiöld ('*Periplus*,' X.).

⁴ Marcos Jimenez de la Espada, who published this interesting document in the *Boletín* of the Geogr. Society of Madrid, II., 1877, believes the friar to have been born in 1305, and the '*Conocimiento*' to have been compiled in 1345.

⁵ Ayres de Sá, '*Frei Gonsalo Velho*,' 3 vols., Lisbon 1893-1900. Cabral was the family name of Velho's mother. See Plate for a map of these islands.

⁶ Hamy, '*Études*,' pp. 111-120, furnishes information on this cartographer, and publishes his chart of the Mediterranean drawn in 1449, and purchased by Amerigo Vespucci for 130 golden ducats. His map of the world has not yet been published.

dated 1489, and in that very year the youthful King Afonso V., with the consent of the Queen-mother and of the Regent D. Pedro, authorised his uncle Henry the Navigator to people the "seven islands of the Azores,"⁷ thus named after the flocks of wild birds, supposed to be hawks (açores), but which were in reality kites (milhanos).

The third group, including Flores and Corvo, was certainly re-discovered before 1453, for in January of that year Corvo was granted to D. Afonso, Duke of Bragança, the bastard son of John I.⁸ It is probable that the discoverer was João de Teive of Madeira, whose pilot, Pedro de Velasco, told Columbus at Rabide that this discovery had been made in 1452 in the course of an unsuccessful search after Antillia.⁹

On the death of Henry the Navigator, in 1460, the Azores were transferred to Don Fernando,¹⁰ the Navigator's nephew and adopted son, and his successor as Master of the Order of Christ.¹¹ When Fernando died in 1470, he was succeeded by his son, Don Diogo, Duke of Vizeu, after whose murder by John II. in 1484, the islands were granted to the King's brother-in-law, Don Manuel, Duke of Beja, who subsequently became famous as King Manuel the Fortunate.

Nomenclature of the Azores.

The names borne by the seven islands of the Azores, and of Corvo and Flores, since 1345 may be gathered from the table on page 47.

The nomenclature of the Spanish Friar is undoubtedly Spanish (and not Italian or Portuguese), and his knowledge of the archipelago was certainly more complete than was that of the Genoese compiler of the Laurentian Portolano Chart. The only island omitted by him is the *Illa graciosa*, which only made its appearance after the re-discovery of the archipelago had been inaugurated by Henry the Navigator. The *Isla del brazil* may owe its name to a dye-plant—orchil—which reminded its discoverers of the East Indian *brazil*, a dye wood which had found its way into Italy and Catalonia as early as the twelfth century. *Isla del lobo*, Seal Island, seems to me more appropriate than *Lovo*, the egg-shaped island, for S. Maria, resembles by no means an egg; originally S. Maria was named after its discoverer, Gonçalo Velho. The names of the other islands may be translated thus:—Goat Island, St. George,

⁷ '*Alguns documentos*,' p. 6.

⁸ '*Alguns documentos*,' p. 14.

⁹ Harrisse, '*Christopher Columbus*' (Paris, 1884), I., 311. In 1474 Diogo de Teive, the son of the discoverer, was authorised to cede the island to Fernão Telles ('*Alg. doc.*,' p. 38).

¹⁰ D. Fernando, Duke of Vizeu, born 1433, was the son of King Duarte and the father of King Manuel and Queen Lianor, consort of King John II. His sister D. Leonor, married the Emperor Frederick III. in 1451. His widow, D. Brites or Beatrice, was a granddaughter of King Duarte.

¹¹ Letters patent (carta de mercê) of December, 1460 ('*Alg. doc.*,' p. 27).

Spanish Friar, 1345.	Laurentian Fortulano, 1351.	Gabriel de Valsequa, 1439.	Bart. Baroto, 1455.	Costa de Menez, Dec. 3, 1480.	Ginea Portuguesa, 1485.	Martin Behaim, 1492.	Modern Names. 1906.
Isla del lobo . .	..	Y. de sparte . .	Love	Santa Maria .	S. Maria . . .	S. Maria . . .	S. Maria
I. de las cabras .	Ins. de Cabrera .	quadrilla . . .	Capraria . . .	San Miguell .	S. Michiel . . .	S. Michel . . .	S. Miguel
I. del brazil . .	Ins. de brazi . .	Ylla de linferno .	I ^a de brazill .	Jesu Christo .	Y. Tercera . .	Jesu Christo .	Terçeira
..	..	..	..	Ilha graciosa .	Y. graciosa . .	..	Graciosa
I. de Sint Jorge .	..	Ylla de frydols .	San Zorzo . .	San Jorge . .	Y. S. Jorie . .	..	S. Jorge
Le columbaris .	{ I. de ventura, s. de colombis }	Y. de osels . .	Collonbi . . .	San Dinis . .	pico	Pico	Pico
I. de la ventura .	..	Y. de	I. de ventura .	San Luis . . .	Y. ofaial . . .	{ Faial or New Flanders . . }	Fayal
Isla de los conejos	..	..	Lá Conieri . .	San Tomas . .	Ya dafflores .	Flores	Flores
Isla de los cuervos marinos	I. de corvis marinis . . . .	..	Corui marini	Santa Eyrea .	Y ^a del corvo .	..	Corvo

the Pigeon-cote, Venture Island, Coney and Cormorant Islands.

Santa Eyria (Iria) is called Santa Anna by Soligo (about 1480); whilst Faial on the map of modern Spain in the edition of Ptolemy published at Ulm in 1482 is called St. André.

The names on Gabriel de Valsequa's map are probably those given by Diogo de Sevilla.

The Colonization of the Azores.

The earliest settlers of the Azores were Portuguese and their "captivos," that is, Moors and negroes kidnapped on the coast of Africa. But Portugal was a small country, the resources of which, in men and treasure, had been wasted in unprofitable wars in Africa. The population remained stationary, if it did not decrease, and the country, which almost down to the close of the fourteenth century had exported wheat, had become dependent for part of its food supplies upon Flanders and Brabant.¹ These commercial relations with Lower Germany date back to the twelfth century, when Crusaders² from Flanders and the Lower Rhine helped the Portuguese in their struggles with the Moors. The Portuguese ever since 1385 had their "borsa" (factory or inn) at Brügge. The relations between the two countries became even closer when D. Isabel, the daughter of King John I., married Philip the Good of Burgundy,³ in 1429. Many Flemings had settled in Portugal, and it is only natural that among those who solicited privileges in the newly discovered countries there should be compatriots of theirs.

Flemish Colonists.

Most prominent among the Flemings connected with the peopling of the Azores were Jacob of Brügge, Willem van der Haghe and Josse van Hurter.

Jacob of Brügge—Jacomoe de Bruges—had been granted the captaincy of Jesu Christo or the ilha Terçeira on March 3, 1450. His experiences were disappointing, and when he died D. Brites, the widow of D. Fernando, Duke of Vizeu, in 1474, transferred the captaincy to João Vaz Cortereal,⁴ the father of Gaspar, one of the earliest visitors, if not the discoverer, of Newfoundland, and Alvaro Martins Homen,⁵ the one settling at the Angra, the other at a villa da Praia. Another Fleming, Fernão Dulmo or Ferd. van Olm, a cavalier of the Royal Household, is mentioned as one of the captains of Terçeira, who had established himself on the north coast of that island, at the Riveiro dos Flamengos. It was he who in 1486 jointly with João Affonso do Estreito proposed to fit out an expedition for the discovery of the island of the Sette cidades.⁶

Willem van der Haghe, whose name the Portuguese perverted into Vandaraga, whilst he himself had translated it as Guilherme da Silveira, first settled on S. Jorge, and having vainly tried his fortune in other islands, including Corvo and Flores, where he appeared as the representative of D. Maria de Vilhena,⁷ returned in the end to S. Jorge, and became the founder of one of the wealthiest families in the Azores. His son, Francisco, married Isabel de

¹ See an anon. 'Memoria para a hist. de agric. em Portugal' ('Mem. de Litt. Port.,' II., 1792).

² Flemish Crusaders, in 1147, took part in the siege of Lisbon; in 1189 they captured Silvas, and in 1214 Crusaders led by William I. of Holland and George von Wied took Alcaçer do Sal.

³ When Philip died in 1467, his widow retired to a convent and died there in 1469; Charles the Bold, their son, was born 1433, and fell at Nancy 1477. Their granddaughter Maria married Maximilian, King of the Romans, in 1477.

⁴ On this family see E. do Canto, 'os Corte Reaes' (Ponta Delgado, 1883) and 'Archivo dos Açores,' I., 155, 443; H. HARRISSE, 'Les Corte Real et leurs voyages,' Paris, 1883. João Vaz died 1496.

⁵ The letters patent are published in Drummond's 'Annaes da ilha Terçeira,' 1800-1, and in the 'Arch. des Açores,' IV., 159.

⁶ 'Alguns documentos,' p. 58.

⁷ This lady, in 1473, was aia (governess) and Mistress of the Robes of D. Lianor, the sister of King Manuel and wife of John II. Her father was Martin Affonso de Mello, Governor of Olivença, her mother D. Margarita de Vilhena (A. Braancamp Freire, 'Livro dos brasões,' I., 25; A. C. de Sousa, III., 142).

Macedo, a daughter of Joz d'Utra; his grandson called himself Joz d'Utra da Silveira.¹

The Hurters (Huertere) of Flanders.

Of far more interest is the history of Josse van Hurter,² for it was a daughter of this Captain donatory of Fayal whom Martin Behaim married about the year 1487.

The Hurters or Huertere were an old Flemish family, and as far back as 1386 they are mentioned as magistrates (échevins) of the liberty (Vrije) of Brügge. Their arms in 1354³ were charged with three roundels, within each of which was depicted a star of six rays. The Hurters of Fayal, however, were not content with this simple coat of arms, but devised one more elaborate, as follows:—

Shield, *azul* charged with three roundels *or* (i.e. bezants), each roundel charged with a cat *sable*. Crest: a vulture proper, armed *or*.⁴

Josse van Hurter, the first Captain donatory of Fayal and Pico, was the youngest son of Leo de Hurter, bailiff of Wynendaal and lord of Haegebrock, two dependencies of the village of Hooghlede, three miles to the N.W. of Roulers (Rousselaere) in Flanders. Behaim speaks of his father-in-law as Lord of Moerkerke, but the town clerk of that flourishing manufacturing town informs me that the name of Hurter is absolutely unknown there, and that the castle never belonged to a family of that name.⁵

After the death of Barthelemy, the eldest of the five brothers, who died a bachelor, Haegebrock became the property of his brother Baudouin or Baldwin, who seems to have kept up some intercourse with his relations in Fayal. There is still extant a letter which Diogo, a son of this Baudouin, wrote to Joz d'Utra in 1527.⁶

Joz d'Utra (Josse van Hurter) as Capitão donatário.

The circumstances under which Joz d'Utra became Captain donatory of Fayal⁷ and Pico, notwithstanding the

¹ W. Guthrie (born 1708, died 1770), the reputed author of a 'New System of modern Geography' (London, 1774), is responsible for the statement that the Azores were discovered by one Josuah van der Bergh in the middle of the fifteenth century. Baudet (*l. c.* pp. 97-103) fully discusses this question, and exposes the authors who spread the fable.

² The Portuguese called him Joz d'Utra or de Hutra. Josse, Jobst, Jost and Jodocus are synonyms.

³ 'Registre de Franc,' 1354, No. 632, p. 92, kindly communicated to me by Dr. Mees.

⁴ I am indebted for this description to Senhor Gabriel Pereira. It is possible that the "cats" may be meant for "gatas de algalia" or civet-cats, and the vulture for a kite, this being the true representative bird of the Azores.

⁵ Nor is it correct to say that the Hurters originally came from Austria. There is a village Habrk in Bohemia, but Dr. Witting, the secretary of the Imp. Society of Heraldry "Adler," informs me that no Hurters are known in Austria.

⁶ 'Arquivo dos Açores,' I., 162.

⁷ Faial means beech-wood, but the beeches after which the island is named have turned out to be myrtles (*Myrica Faya*), just as the hawks (açores) have turned out to be kites.

legends on Behaim's globe and the information furnished by Valentin Ferdinand,⁸ are only imperfectly known.

We gather from these and a few other sources that D. Beatriz, the consort of D. Fernando, who had been granted the Azores after the death of Prince Henry the Navigator in 1460, had a chaplain, a Fleming named D. Pedro, whom she desired to reward for faithful service. This chaplain, in 1465, came to Flanders on a mission to D. Isabella, the consort of Philip the Good, Duke of Burgundy. At the ducal court he became acquainted with Josse van Hurter, an equerry of the Duchess. This young nobleman had three wealthy brothers, but, having been attached to the court, his own estate had much suffered. When the friar spoke to him about the Azores, and their supposed wealth in silver and tin, young Hurter saw rising before him a vision of great wealth. When the friar promised to use his influence, and to obtain for him the captaincy of one of these islands, he eagerly embraced the offer.

Having secured at Brügge the co-operation of fifteen competent workmen (trabalhadores), whose fortunes he promised to make, he went to Portugal. Thanks to the recommendations of the chaplain, backed, as they probably were, by the Duchess Isabella of Burgundy, he obtained leave to people Fayal.⁹

He took his fifteen companions to that island, and no doubt a number of other colonists, but the venture ended in disappointment. Neither silver nor tin was found, and when the colonists, after a year's search, had come to the end of their resources they turned upon their leader, and threatened him with death.¹⁰ Hurter escaped their violence and returned to Portugal. D. Fernando and his consort admired his spirit of enterprise. They not only promoted his marriage with Brites (Beatriz) de Macedo, a beautiful maid of honour in their household,¹¹ but also furnished him with ships and men, which enabled him to return to Fayal. Having re-established his authority, the colonists introduced by him set to work; they grubbed up the soil; cattle were imported from the neighbouring islands, and in the course of time Willem Bersmacher, a Fleming, introduced the cultivation of woad, which proved profitable. The island, however, does not appear to have proved a source of wealth to its captain donatory. It yielded orchilla, woad, wheat, oranges, and lemons and a little wine, and afforded forage for cattle and pigs, but ready money seems at all times to have been scarce. Brites de Macedo, the wife of Joz d'Utra, in her will of 1527,¹² refers to a debt of thirty years' standing, whilst Dr. Monetarius,¹³

⁸ See in Appendix XI., p. 114.

⁹ According to Valentin Ferdinand this happened in 1469; according to Behaim in 1466.

¹⁰ Cordeiro, 'Hist. insulana,' VIII., c. 2, speaks of a revolt headed by Arnequim, a Fleming, who defied the Royal corregedor (magistrate), and threatened to shoot Hurter with his cross-bow.

¹¹ Confirmed by Barros, 'Chronica do Imperador Clarimundo,' Lisbon, 1601, t. I., liv. III., c. 1.

¹² 'Arquivo dos Açores,' I., 164, 170.

¹³ 'Abh. d. hist. Cl. d. K. bayr. Ak. d. W.,' VII., 1854, p. 361.

writing in 1494, tells us "vectigalia apud ipsos sunt in bono foro, sed divitiae argentae non magnae," which I take to mean that though victuals were plentiful there was always a lack of ready money.

The Privileges of a "Captain Donatory" or Governor.¹

The *captães donatorios* or hereditary governor of the islands discovered by the Portuguese were appointed either by the king himself or by the person to whom the island had been granted. The dignity was hereditary, as a rule, in the male line only. In the case of the death of a grantee his lawful successor was bound (in conformity with a law of 1434) to apply to the king for a confirmation of the act by which his family originally benefited, and this confirmation might be refused. Such application was usual also on the accession of a sovereign.

The captain was entrusted with the exercise of criminal and civil jurisdiction, subject to respecting Royal writs and the decision of judges in circuit (*correições*), and to the limitation that sentences, involving the loss of a limb or death, had to be referred to the king for confirmation. He enjoyed the monopoly in corn-mills, public baking houses and the sale of salt, and was entitled to claim the payment annually of one mark silver (or of two deals a week) from the owner of a saw mill, and a tenth of the profits of all metalliferous mines. The captain, moreover, was authorized to grant land to colonists on payment of a rent in money or in kind, and on condition that it was brought under cultivation within five years. Land not cultivated might be claimed by the king. Tenants, however, were permitted to sell the tenant rights of the land they had brought under cultivation, to kill wild beasts and to pasture their tame cattle throughout the island. The governor moreover enjoyed the tenth of the Royal revenues. His privileges were consequently very considerable, and abuses of the powers entrusted to him were by no means rare.

The Peopling of Fayal.

Martin Behaim most certainly exaggerates when he tells us that the Duchess of Burgundy sent 2,000 colonists to the island, which increased so rapidly that in 1490 there lived there many thousand Germans and Flemings; for Monetarius, who was at Lisbon in 1494,² was told by the wife of Joz d'Utra that at that time, and including Pico, there were only 1,500 inhabitants of both sexes, all of them Flemings. But whatever the original number of Flemish colonists, they quickly became merged with or were superseded by the Portuguese. As early as 1507, we are told by Valentin Ferdinand, the Flemish language was nearly extinct, and when Jan Huyghen van Linschoten³

resided in the Azores (1589-91) the Flemish language had become extinct, although many of the inhabitants resembled Netherlands in physique, and thought kindly of their forefathers.

It is owing to the early Flemish settlers that the islands of Fayal and Pico became known as the "Flemish islands." Abraham Ortelius, the eminent geographer (born 1527 at Antwerp, died 1598), in the notes accompanying Ludovicus Teisera's map of the "Açores Insulae, 1584," extends this appellation—*Vlaemsche eylanden*—to the whole group, on the ground that merchants of Brügge had been the first to discover them.

Joz d'Utra and his descendants.

Josse van Hurter, the first Captain donatory of Fayal, as has been already stated, married D. Brites or Beatriz de Macedo, a maid of honour in D. Fernando's household, and a member of one of the most illustrious families of Portugal. Her ancestor, Martin Gonçalves de Macedo, had saved the life of King John I. at the battle of Aljubarrota, 1385.⁴ Her family owned estates in Madeira, and these yielded the sugar which her husband exported to Flanders.

There were six children by this marriage. The eldest son, named like his father, Joz d'Utra, married Isabel, the daughter of João Vaz Cortereal; a daughter, Isabel,⁵ married Francisco da Silveira (v. d. Haghe); another daughter, Joanna, married Martin Behaim.

The captain donatory and, at all events, his family appear to have spent much of their time at Lisbon. It was there that Dr. Monetarius, when he stayed in that city from November 27 to December 2, 1494, was hospitably entertained by the family of Joz d'Utra. They occupied one of the King's houses in the Rocio, near the church of S. Domingos. Dr. Monetarius⁶ describes the lady of the house as being of "noble birth, intelligent and of wide experience." She presented him with a sample of musk obtained from S. Thomé. Dr. Monetarius makes no reference whatever to his old friend Martin Behaim, who was probably at Fayal, nor to Valentin Ferdinand, who acted as his interpreter.

Joz d'Utra died in 1495,⁷ and was succeeded by his eldest son, who bore the same name. An incident in the life of this governor is of some interest to us, as an official document connected with it refers to the wife of one Martin Behaim.⁸

It appears that Joz d'Utra charged Fernão d'Evora,

⁴ Arms of the Macedos as described by A. Braancamp Freire, 'Livro dos brasões da sala de Cintra,' I, pp. 99, 113: field azure charged with five stars, or, in saltire.

⁵ This is the thona Isabel of George Pock.

⁶ For the account of Monetarius see 'Abh. d. hist. Ch. d. K. bayr. Ak. d. W.,' II, 1847; VII, 1855.

⁷ His wife survived until 1531. For her last will and testament (1527) with a codicil (1531) see 'Arch. dos Açores,' I, 164.

⁸ 'Arch. dos Açores,' IX., 1887, p. 194.

¹ For conditions of a letters-patent (*carta de mercê*) of this kind see Mendo Trigoza, 'Mem. da litt. Portuguesa,' VIII., p. 390.

² L. c., p. 361.

³ 'Itinerarium ofte Schip-vaert n. e. Oost ofte Portugaels Indien,' (Amsterdam, 1644), pp. 146-157.

who had been appointed in July, 1492, Mamposteiro mór dos Captivos¹ for the Azores, with having been found with his sister Joanna, the wife of Martin Behaim. The accused was put in chains and embarked for Lisbon, but managed to escape. The King on November 16, 1501, granted him a "carta de perdão" (pardon), but when he returned to the Azores, he was once more cast into prison. In the end his son succeeded in proving his innocence of the adultery charged against him, and Joz d'Utra was ordered to molest him no further.

Manuel d'Utra Cortereal, the son of Joz d'Utra II. and his wife Izabel Cortereal, succeeded in 1549, but being charged with bigamy he was removed from his high position, and it was only after a protracted law-suit² that his son and heir, Jeronimo d'Utra Cortereal, was given possession of his father's office. This happened in 1582. Jeronimo departed this life in 1614, the last of his line, his only son Luiz having died before him in India, in 1600. After his death the captaincy of Fayal and Pico was granted to D. Manuel de Moura Cortereal, the first conde de Lumiares.³

Martin Behaim in Fayal, and his family.

Of Martin Behaim's family life in Fayal we know next to nothing. We are unacquainted even with the circumstances which led to his marriage with Joanna de Macedo, the daughter of Joz d'Utra. This marriage took place at latest in the spring of 1488, for his son Martin was born April 6, 1489.⁴ There were no other children. Such at least is the result of careful inquiries made in 1518 by Jorg Pock by request of the family.⁵ E. do Canto ('Arch. dos Açores,' VII., pp. 401-415) declares that he had no further descendants in the male line.

After the death of her husband, in 1507, the widow, "being at the time still young, and it being the custom for young widows to marry again,"⁶ wedded D. Henrique de Noronha of Madeira, and thenceforth resided in that island.

A projected Voyage of Discovery, 1486.

We do not know how Behaim was occupied after his return from his African voyage, during his residence at Fayal or during occasional visits to Lisbon. It is to be

¹ Collector-in-chief of the captives or slaves.

² See Cordeiro, 'Hist. Insulana,' p. 458, for the history of the law-suit.

³ 'Arch. dos Açores,' IV., 229.

⁴ This date is given in a letter of Michael Behaim to Jorg Pock dated December 16, 1518 (Ghillany, p. 43).

⁵ Ghillany, Urk. XVII. and XVIII. A. Cordeiro ('Hist. insulana,' VIII., c. 4), on the other hand, asserts that there were two sons both named Martin; that the father, after the death of the first-born, visited Bohemia, his native country, whence he came back with great wealth, but that after several years' residence he returned to Germany for good, and that neither he nor his second son were again heard of!

⁶ So says her son Martin in a letter of August 13, 1518, to Michael Behaim, his uncle (Ghillany, p. 108). The widow, in 1507, must have been close upon forty years of age, but she owned estates in Madeira!

presumed that he assisted his father-in-law in the management of his estate. He may even have dabbled in astrology, and devoted some time to the study of cosmography, but there is no evidence whatever that he followed a maritime career. The only voyage of discovery with which his name has been associated is a joint expedition proposed by Fernão Dulmo (Ferd. van Olm), one of the captains of Terceira and João Affonso do Estreito of Madeira, which was authorised by King John on July 24, 1486. Two caravels were to leave Terceira in March 1487, in search of the mythical "Ilhas das sete cidades," and of a "terra firme," and it was agreed that the "German cavalier who desired to join this enterprise should be permitted to embark in either of the caravels." Ernesto do Canto suggests that this "German cavalier" can have been no other than Martin Behaim. But if this is the case, and if the expedition really started, it is curious that no reference to it whatever should be discoverable on Behaim's globe.⁷

Martin Behaim's Prophecies.

It might be supposed that valuable and trustworthy information on Martin Behaim might be found in the 'Historia insulana das ilhas a Portugal sujeitas na Oceano occidentale,' compiled by Antonio Cordeira, and published at Lisbon in 1717, for the author was able to avail himself of a valuable MS., 'As saudades da terra,' compiled by Dr. Gaspar Fructuoso.⁸ His work unfortunately contains but little information. He tells us (IX., c. 3, § 41):—

"Martin de Bohemia was a great mathematician and so distinguished an astrologer that the King, when he came to the Court, esteemed him highly, not only on account of his noble birth, but also on account of his learning, and the knowledge which he owed to the observation of the stars. This was so remarkable that the King, trusting to this knowledge, despatched vessels for the discovery of the Antilhas (West Indies), and Bohemia foretold day and hour when these vessels would return, and they did return without having discovered the Antilhas. And he divined so many other things by observing the stars, and these things turned out afterwards to be true, that the ignorant people, instead of looking upon this nobleman as an excellent astrologer, took him to be a necromancer."

This prophecy may refer to any of the expeditions

⁷ Bernardino José de Senna Freitos, in his 'Memoria hist. sobre o intentado descobrimento de uma supposta ilha ao norte de Terceira,' (Lisbon, 1845), was the first to refer to this expedition. For the Royal authority see 'Alguns documentos,' p. 58, and E. do Canto's 'Arch. dos Açores,' IV., 441. Harisse, 'The Discovery of America,' p. 655, enumerates 13 expeditions which sailed between 1447 and 1493 in search of western islands.

⁸ For biographical notice on G. Fructuoso and A. Cordeira, see p. 3. Alvaro Rodriguez de Azevedo published an annotated edition of the 'Saudades' as far as they refer to Madeira (Funchal, 1873). A work on Fayal by A. Pedro de Azevedo, I have been unable to obtain.

which sailed to the west, and not one of them met with success. Fructuoso after this communicates *three* prophecies of a more remarkable nature, all of which, he maintains, turned out true. They are as follows:—

"In the first place he (Behaim) said that a time would come when a man would be happy who had a good ship, which would enable him to leave these islands. And this was found to be true during the troubles and wars¹ between Philip of Spain and his cousin D. Antonio, in the time of the conflagrations (volcanic eruptions), earthquakes, etc.

"In the second place, and before the discovery of the Indies of Castile, he said that to the south-west of Fayal, where he then was, he saw a planet dominating a province the inhabitants of which used dishes of gold and silver, cargoes of which would reach Fayal before long. And within a few years vessels laden with gold, silver and precious stones coming from Peru arrived at Fayal.²

"In the third place he said that to the south-west of Fayal and Pico three islands remained to be discovered, one of which was very large and properly called Madeira, the other was smaller, and the third was the smallest."³

Dr. Günther (p. 70) suggests that Behaim's reputation as a prophet may have been due to his predicting eclipses of the sun or moon, which he might have done, without consulting the stars, by consulting a book like the 'Calendarium eclipsium p. a. 1483-1530,' in his days in common use among seamen.

XV. THE DEATH OF BEHAIM, 1507.

Wolf Behaim's death at Lisbon.

WOLF BEHAIM, the youngest brother of Martin, appears to have come to Lisbon towards the close of 1506 as the representative of the Hirschvogels of Nuremberg, and among the "novelties" introduced by him into the great mart of Western Europe were pocket watches which struck the hours, or "Nuremberg eggs," then recently invented. He evidently met there with his brother in distressed circumstances and living away from his wife, for in reply to a letter which he addressed to his brother Michael at Nuremberg, the latter replied on January 30, 1507, as follows:—

"I, for my part, cannot mend Martin Behaim's affairs; this and other things we shall have to leave to God. I should like to know how his wife (*weib*, wife, not widow!), his son and their friends are, also who they are and where."⁴

¹ The war between Philip of Spain and D. Antonio, prior of Crato, broke out in 1580. The Azores, having declared in favour of D. Antonio, were invaded and conquered by the Spaniards in 1582-3 (Antonio de Herrera, 'Cinco libros de la Historia de Portugal, y conquista de la islas de los Açores,' Madrid, 1591). A fearful earthquake occurred in 1522, and its ravages extended from the Azores to Morocco and Granada.

² Peru was first heard of in 1524!

³ This of course may refer to Madeira, Porto Santo and Bugio.

⁴ Ghillany, Doc. XII., p. 107.

Wolf, unfortunately, died on March 20, 1507, a bachelor. He either made no testamentary dispositions at all or appointed his three brothers and his sister Ursula joint heirs *in stirpe*.⁵ His place of burial is not known with certainty. J. Pock, in a letter to Michael Behaim, dated Lisbon, March 25-30, 1519,⁶ says that "he was buried in the church of S. Maria da Conceição, a sumptuously decorated edifice much frequented, especially by Germans." He adds that his grave is in the middle of the church, by the side of that of Paulus Imhof, and that an ornamental tombstone would cost from 7½ to 20 cruçados, and that if it were to be kept for all time one mark silver (about 2 guineas) would have to be paid to the church. Martin Behaim, he states, was buried in the church of S. Domingos.⁷

The church of N. D. da Conceição, now known as "Conceição velho," was originally a synagogue which D. Manuel in 1500 gave to the Order of Christ in exchange for the old chapel of Our Lady of Restello, upon the site of which rose the magnificent monastery of Belem. It was not, however, at any time a church frequented by Germans, who worshipped at S. Julião and at S. Domingos, where chapels were set aside for their brotherhoods. J. Pock, who wrote many years after the event, was no doubt mistaken. A MS. Genealogy of the Nürnberg Patricians (Schwarz, Compl., No. 99) now in the town library, quoted by Ghillany, p. 19, but of little authority, tells us that Wolf, an astrologer, died at Lisbon, a bachelor, in 1509 (*sic*) and was buried in the Church of the Predicant Friars there, by the side of Ulrich Imhof." I gather from these conflicting statements that Wolf Behaim and Ulrich or Paulus were laid at rest, side by side, in the same church; and as we know that Martin Behaim was buried in the church of the Dominicans or Predicant Friars, this church, most probably, was that of S. Julião.⁸

The death of Martin Behaim.

Martin Behaim did not long survive his younger brother, for he died on July 29, 1507,⁹ very poor and in a

⁵ Michael Behaim on Nov. 12, 1518, wrote to Jorg Pock that Clas Humbrecht of Antwerp had informed him that Wolf Behaim had left behind him clothes, striking watches (Schlagurlein) and other things, which were to have been sold by Sebald Kneusel, but that up to then no money had been received on that account (Ghillany, Doc. XVI., p. 112).

⁶ Ghillany, Doc. XVIII., p. 104.

⁷ J. Pock to Michael Behaim, March 25-30, 1519 (Ghillany, Doc. XVIII., p. 114-115). Biedermann, 'Geschlechtsregister,' Tafel, 221, says, "Paulus Imhof spent many years in Portugal, stood high in the favour of the King, and died there in 1507, and is buried in the church of St. John, where he has a considerable monument."

⁸ See p. 11 for an account of these churches.

⁹ Murr, Ghillany and even Günther state that Behaim died in 1506, but there can be no doubt that he died in 1507. The inscription upon the hatchment in the Church of St. Catherine proves this, and also an inscription upon his portrait, where Murr read "1506," but which a trustworthy person in the service of the family assured Humboldt ('Kritische Untersuchungen,' I., 230) reads "Obiit a MDVII. Lisabonae."

hospital, as J. Pock was told by one of the executors of Arnold (Reynold) Nies, to whom Martin at the time of his death owed 15 cruzados, and who was therefore likely to be well informed on the matter.¹ Of the causes of his poverty we know nothing definite. Dr. Günther (Note 139) suggests that after the death of King John, in 1495, he lost the favour of King Manuel because he had taken a prominent share in transactions which would have cost Manuel his crown, as reported by Peter Martyr. But this industrious letter-writer, although he refers in his 'Opus epistolarum' to the disputes between King and Queen concerning D. Jorge, does not once mention the name of Behaim in connection with this question or in any other instance. It is far more reasonable to suppose that the large fortune which he had derived from Nuremberg had been dissipated by him in idle speculations, and that after the death of his father-in-law, in 1495, his family left him to his own resources.

I believe that he died in the Hospital de todos os Santos, of which the foundations had been laid by King John in 1492 in the Garden of the Monastery of the Dominicans, and close to their church in which he was buried. A chapel within that church had been granted in 1422 to the German and Flemish brotherhood of the Holy Cross and St. Andrew, a brotherhood which looked after its members in sickness, and saw to their decent burial.

Memorials at Nuremberg.

But whilst Martin Behaim's grave at Lisbon was soon forgotten, and can no longer be traced, his son in 1519, whilst at Nuremberg, placed a more permanent memorial in the church of St. Catherine. A trefoil hatchment (Scutum trifolium) in the quire, to the right of the altar, exhibited in the centre the coat of arms of the Behaims, and on the left what Murr took for the coat of arms of the Macedos, but which was really that of the Hurters.²

The inscription was as follows:

1507, Pfintztag . nach Jacobi 29,
Juli . Starb . der . gestreng . vnd .
vest . her . Martin Beheim . Ritter .
im . Kynckreich . zu . Portugal . dem .
gott . Gnedig . sey.

1507, on Thursday after Jacobi
July 29th³ there died the worship-
ful and valiant Herr Martin
Beheim, knight in the kingdom of
Portugal. May God have mercy
upon him.

A sexagonal iron chandelier, suspended in the very centre of the quire, above the tomb of Konrad of Neumarkt, served as a further memorial. It is in two shelves. Upon the lower shelf are several groups of rocks, upon one of which was placed a recumbent figure of St. Catherine, whilst chaplets occupied the spaces between

¹ This creditor Nies is repeatedly referred to in the correspondence between J. Pock and Michael Behaim. See Ohllany, documents No. XVI, XVII, and XVIII, pp. 112, 113 and 114.

² Murr (p. 122) describes it thus: Field *argent* charged with three pellets (roundels) *sable*, charged with stars *or*. See pp. 48, 49.

³ Thursday after Jacobi, 1506, corresponds to July 30!

the others. Below were two shields; the one containing the arms of Martin Behaim together with those of his parents and grandparents, represented by the families of Schopper, Hirschvogel and Muffel; the other, those of his wife Johanna de Macedo, with the words, "Desiderans desideravi ore" (grieving I desired to pray). The hoop or ring bore this inscription: "Serenissimi Portugalie Regis, Martinus Beheimus, miles auratus, Affricanos Mauros fortiter debellavit, et ultra finem Orbis terre uxoravit" (Martin Behaim, knight of the most serene King of Portugal, stoutly fought the African Moors, and married beyond the ends of this earth).⁴

Similar coats of arms were placed beneath the upper shelf, and at their sides were statuettes of Martin Behaim and his wife, and the inscription: "In memoria eius." Along the upper hoop we read, "Joanna Capitanei Portugalie Regni filia, insularum Azorum Catheridum, domini Flandrie nouae. Uxor Domini Martini Bohemi Militis Foelix memoria," i.e., Johanna, daughter of a Captain of the Kingdom of Portugal, the lord of New Flanders of the islands of the Azores or Catherides,⁵ wife of the lord Martin Behaim, knight, of happy memory.

Hatchment and chandelier were removed from the church at the beginning of last century. It has been stated that they had been removed to the Germanic Museum, but I failed to discover them there.

The Monument of Behaim at Nuremberg.

A more permanent and public memorial in honour of Martin Behaim was unveiled at Nuremberg on September 17, 1890. It consists of a bronze statue modelled by Professor Rössner. The "Navigator" is represented clad in armour, with a globe by his side and allegorical figures of Science and Commerce sitting at his feet. On the day mentioned a procession, *more germanico*, proceeded from the town-hall to Behaim's house of birth, where the choral societies sang a cantata written by Hans Barth and composed by the gifted Franz Lachner,⁶ after which it moved to the Egydienberg, where Dr Günther, standing at the foot of the monument, delivered the "Festrede."

There exists also a medal struck on the occasion of the celebration of the tercentenary of Albert Dürer's death in 1828. It was engraved by Anton Paul Dallinger (b. 1772). On its obverse it has portrait busts of Dürer and Behaim, and the words "His gaudet nobis alumnus."

The reverse shows a seated figure of Norunbergia, with emblems of arts, science and industry, and the words "Hae tibi crunt artes."

Of Martin Behaim it certainly cannot be said what has been said of certain prophets, that he had no honour in his own country.

⁴ Add: "as known to Ptolemy!"

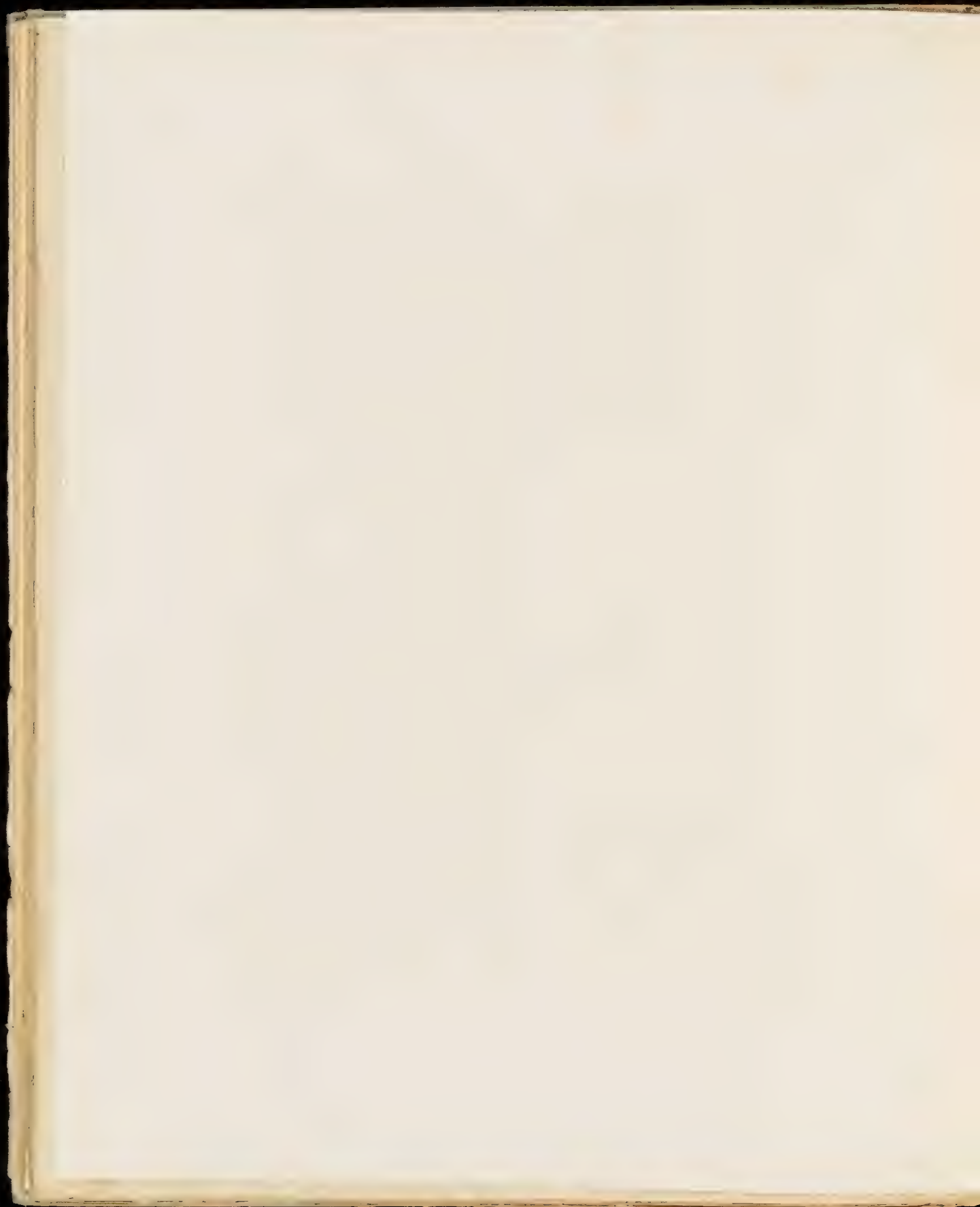
⁵ Catherides is a corruption of Cassiterides, the tin islands at one time identified with the Azores.

⁶ He was born at Rain in 1804, and died on January 20, 1890.



BEHAIM'S MONUMENT AT NUREMBERG.

From a Photograph by F. Schmidt.



And more recently still, during the meeting of a Geographical Congress at Nuremberg, a little "Festspiel," "Im Hause Martin Behaim's," written by Frau Helene von Forster, was performed on May 21, 1907. This Festspiel, however, not any more than Schiller's classical dramas, can be accepted as representing historical truth.

XVI. MARTIN BEHAIM THE YOUNGER, 1489-1520.¹

MARTIN, the only son of Martin Behaim and Joanna de Macedo, the daughter of Josse van Hurter, was born on April 6, 1489.² There were no other children—no second brother, as asserted by the untrustworthy Fructuoso—nor a sister. The inquiries made by Jorg Pock on behalf of Martin's relatives at Nuremberg admit of no doubt on that point.³

Young Martin either lived with his mother, who after her first husband's death had married D. Henrique de Noronha, a nobleman of Madeira, or in the house of his aunt Dona Isabel de Macedo, the widow of Francisco da Silveira, at Lisbon. Jorg Pock, who knew her well, speaks to this Dona Isabel (whom he calls Thona Issabl)⁴ as "one of the most honourable and virtuous ladies in all Portugal, who proved a second mother to her young nephew." We know nothing of young Martin's early days or education. To all appearance he spent his days in idleness. Jorg Pock speaks of him as a "good and well-behaved (*frum*) man, singularly devout," not a "lady's man" (*fraw-mann*), but a "very virgin" as compared with the ordinary Portuguese, whom he denounces as rude (*grob*) and arrogant.⁵ Of the Portuguese of his day he says that "they are the most arrogant people to be found in the world, ride about the market square all day with four servants running behind them, and when they get home again they dine off a radish and salt instead of chicken and roast meat. The poorest with us (in Nuremberg) eat and drink better than they do.

Many of the Portuguese never take wine, as they look upon doing so as disgraceful, but when in church they belch to make one's soul shudder, and this they think quite well-behaved." Elsewhere⁶ this same Pock says that "if a man has ten ducats he buys him a camlet coat, a silver-mounted sword, glossy boots and a viola to go at night into the street with, and serenade the strumpets; they poison the air with their arrogance!" Worthy Jorg Pock is severe, but it must be borne in mind that the ancient glories of Portugal had grown faint when he wrote;⁷ an unwonted period of prosperity had resulted in demoralisation.

Young Martin charged with Manslaughter.

Young Behaim was evidently a person of most unsteady purposes, for he attained the age of twenty-eight years without having been able to make up his mind whether to apply for an appointment in the King's household, go to India in search of a fortune, or pay a visit to his relations in Nuremberg. In the end he decided to go to Germany. As a preliminary he paid a visit to his mother in Madeira and received from her sixteen cruzados towards his travelling expenses. On the voyage back to Lisbon a fellow traveller picked a quarrel, assaulted him, and was killed by young Behaim in self-defence.⁸ As a result the latter found himself in prison, where he languished for two years, kindly looked after by his aunt Dona Isabel, and where, considering the protracted judicial proceedings of those days he might have remained to the end of his days, had not the payment of thirty cruzados, made to the Papal nuncio by Michael Imhof⁹ (Incurio), induced that influential priest to intervene on behalf of the unfortunate prisoner and procure his release. But long before this the relatives of young Behaim had appealed for help to his kinsmen at Nuremberg. The influence of Uncle Michael was brought to bear upon the magistrates of the Imperial city, and an official letter¹⁰ was addressed to the King, whose clemency was invoked on behalf of the homicide. But in addition to this, and undoubtedly at the suggestion of the Portuguese relatives, the magistrates informed the King that the Behaims were an illustrious family, who had resided for more than two centuries in Nuremberg and were entitled to coat-armour,

¹ Ghillany, 'Geschichte des Seefahres Ritter Martin Behaim' (Nürnberg, 1853), pp. 107-122, publishes a series of documents bearing upon the history of young Martin, and extending from June 7, 1518, to January 1, 1522. They include two letters from young Martin, three letters from Michael, the brother of Martin, to his nephew and to Jorg Pock, the factor of the Hirschvogels at Lisbon, four letters of Jorg Pock, two letters written by the Magistrate of Nuremberg to the King of Portugal, &c. I have not thought it worth while to reproduce the whole of this correspondence, but have carefully sifted it, and embodied my gleanings in the narrative given above. Translations of the two letters of the Senate have, however, been given by me (see Appendix XII.).

² Michael Behaim, December 16, 1518 (Ghillany, p. 113).

³ J. Pock to Michael Behaim, March 25, 1519 (Ghillany, 116). Jorg Pock was the "factor" of the Hirschvogels at Lisbon. He went out to India in 1521.

⁴ J. Pock to Michael Behaim, March 25, 1519 (Ghillany, 115).

⁵ J. Pock, March 25, 1519 (Ghillany, p. 115).

⁶ In a letter of January, 1523 (Ghillany, p. 120).

⁷ How things grew much worse by the end of the century may be gathered from Diogo do Couto's 'Dialogo do Soldado Pratico,' written 1611, and published Lisbon, 1790. D. do Couto was "chronista" and keeper of the archives of India.

⁸ This is Martin's first version of this incident (see J. Pock's letter of March 13, 1518), but subsequently Pock wrote (August 16, 1518) that Martin had told him that the quarrel took place on the voyage to his mother, with whom he intended to leave 300 cruzados in money and merchandise, which he wished her to take care of during his absence in Germany. No wonder the Nuremberg uncle was puzzled. Michael Behaim to Jorg Pock, December 16, 1518 (Ghillany, p. 113).

⁹ The same to Jorg Pock, November 12, 1518 (Ghillany, p. 112).

¹⁰ For this letter see Appendix, p. 115.

and that Martin Behaim, the father, had married a Portuguese lady of high degree and had done long and faithful service to the King and his predecessors up to the time of his death.

This letter was written on June 7, 1518, but only reached Lisbon three weeks after young Martin had been discharged from prison. He acknowledged the receipt of this letter on August 13,¹ stating that owing to his illness—Jorg Pock wrote that he was suffering from jaundice—and a game leg, the letter had not yet been presented to the King, but that he intended to present it at an early date. However, a few days afterwards, on August 18, at a family council it was decided not to present the letter at all, as it was not deemed wise to remind a King, who held homicides in horror, of a matter which had by this time been forgotten. They desired at the same time that a second letter might be written giving an account of the rank among the nobility of his father and his father's family, so that the King might admit him to the Royal household without a fee (*foro*) being exacted, but that no mention be made of the homicide. This he wrote on August 18.² Not a word did he say in this letter about paying a visit to his friends in Germany. As an additional reason for not troubling the King he might have stated that the plague had invaded Lisbon in August,³ that His Majesty denied himself to all visitors until he started for Crato to meet his fourth bride, Princess Eleanor, the sister of Charles V.

A proposed visit to Nuremberg.

Uncle Michael not unnaturally was rather puzzled by the apparently irreconcilable wishes of his nephew, but sent word at once that his Nuremberg relatives would be glad to see him, and that Ulrich Futterer, one of his uncles, would lodge him for a month, as his own (Michael's) house only sufficed for his own needs, and there was no stable attached to it.⁴ He must not, however, expect to live at Nuremberg at the expense of his relations, for after the expiration of this month he would have to provide for himself. In a letter which, a few days later, on November 12,⁵ he wrote to his friend Jorg Pock, he expressed regret that his nephew had not come to Nuremberg immediately upon his father's death, had learnt a business and made a prudent marriage, instead of making a precarious living as a mariner. The sturdy German Reichsbürger evidently did not look with favour upon his nephew attaching himself as a "servant" to a Royal Court, "as Royal favours were not hereditary,"⁶ and his own father, who had been in high favour with the old King (King John II.), seemed to have fared ill under his successor (Manuel), "concerning

which Pock was probably better informed than they at Nuremberg."⁷ He expressed at the same time anxiety at the extinction of the family of the Behaims, which, at the time he wrote, was represented only by five males. They were Uncle Michael himself, who was suffering from gout, and although married twenty-two years was as yet childless; two sons of his brother Stephen, of whom one was intended for the priesthood; Frederick, a grandson of Leonhard Behaim, and young Martin.⁸

Both Michael Imhof⁹ and Jorg Pock advised young Martin against going to Nuremberg, as he knew no German, and the manners of Germany differed greatly from those prevailing in Portugal. Michael, however, did not quite approve of this advice, as it might lead young Martin and others to think that they in Nuremberg wanted him to stay away, so that his share of the inheritance, amounting in all to about 850 gulden, to which he had become entitled in consequence of the death of his uncle, Wolfgang, might be withheld from him. Incidentally, the uncle remarked that all financial matters between the family and Martin's late father had been definitely settled.¹⁰

Young Martin goes to Nuremberg.

Once the journey to Nuremberg was resolved upon worthy Jorg Pock gave his young friend the best advice in his power.¹¹

He first of all pointed out to him that there was no need for him to go at all, as his business in connection with his inheritance could be transacted quite as satisfactorily by a confidential agent furnished with powers of attorney. He advised him, in case he should only stay a month, not to return without a letter recommending him to the King. He warned him against squandering his inheritance, for it would not go far in Portugal, but rather to seek to increase it, before he thought of marriage. On the other hand, if he proposed a prolonged stay in Germany he must not expect to be placed on a chair and made a gentleman of, or be waited upon, for work was looked upon as honourable in Germany, and he might even be asked to groom one or two horses, to sweep the house or carry fuel into the kitchen. All his relatives, in spite of their noble birth, had worked in this manner, and unless he was prepared to submit to all their hardships it would be better for him to stay at home. This advice was first of all given at Pock's office and repeated in the presence of Martin's mother and grandmother. It did not frighten him. He declared that he was anxious to go, and would shrink from no service that could be demanded from the humblest of his uncle's servants.

¹ Ghillany, p. 107.

² See Ghillany, p. 109.

³ Damião de Goes, 'Chronica do Rei II. Emanuel,' Coimbra, 1790, IV., c. 34.

⁴ See letter of November 5, 1518 (Ghillany p. 111).

⁵ See Ghillany, p. 112.

⁶ "Herrendienst erbt nit."

⁷ See on these relations p. 15.

⁸ See a letter to his brother-in-law, Frederick Behaim, Ghillany, p. 116.

⁹ See Michael Behaim's letter of December 16, 1518 (Ghillany, p. 113).

¹⁰ See Pock's letter of March 25, 1519 (Ghillany, p. 114).

Young Behaim, before he left Lisbon, made his last will and testament, although, as far as Pock could see, he had no property whatever to dispose of; appointed a "good" man as his "factor," and his aunt Isabel his executor. Fifty cruzados which he raised on a bill of exchange¹ he invested in merchandise or expended in presents intended for his German relatives. These presents included five parrots for his uncle, three of which reached Nuremberg, as also a quantity of preserve of service berries, for which he paid his mother 2½ cruzados.

He left Lisbon on April 3, 1519, for Antwerp, where he arrived before May 12, "hale and hearty." Fritz Krausberger,² the representative of the Hirschvogels of Nuremberg, looked after the young traveller, bought him a horse and had him measured for clothes of a sober grey, which his friend Pock had warned him not to wear on his journey for fear of exciting the cupidity of highwaymen. It was arranged that he should accompany the messenger, who travelled regularly between Antwerp and Nuremberg. This man was paid 3 gulden for his services, and for looking after the parrots, of whom three were still alive, and 6 gulden for defraying the expenses of the road. The travellers left Antwerp on May 28, and on June 7 young Behaim reached his father's native town, having accomplished a distance of at least 370 miles in the course of eleven days. Altogether he had spent sixty-six days on the journey from Lisbon to Nuremberg, instead of about five weeks, which his uncle thought would suffice,³ and thus, partly owing to a postponement of his departure, and apparently still more to a tedious sea voyage, he was unable to reach his destination by May 5, on which day the Imperial Crown jewels and relics were publicly exhibited in front of his uncle's house—a high holiday for the loyal Nurembergers.

Young Martin at Nuremberg.

The reception which young Martin met with on the part of his relatives seems to have been very cordial, for he wrote to Jorg Pock that Uncle Michael and his wife treated him as if he were their son, at which his friends at Lisbon were highly pleased. He at the same time sent his Aunt Isabel a present of a rosary. Presents seem likewise to have been exchanged between Uncle Michael and this aunt.⁴ We know, at all events, that the latter had intended to forward to her Nuremberg friends a present of marmalade⁵ of quinces and of other delicacies,

but did not do so, as fruit had failed that year. Subsequently Uncle Michael asked Dona Isabel to procure him two dozen boards of cypress and other costly woods from Madeira and S. Miguel. These boards, however, were not intended as presents, for Jorg Pock paid three ducats for them.

Law Proceedings.

The legal business connected with the distribution of the inheritance of Wolfgang Behaim, whose death at Lisbon, on March 20, 1507, we have already noticed, appears to have been settled without much loss of time. On July 1, 1519, young Martin, who was utterly ignorant of his father's language, appeared before the Court, accompanied by Lazarus Nürnberger as his interpreter.⁶ From the legal document drawn up on that occasion and published for the first time by Dr. Günther (p. 81) it appears that Wolfgang had either died intestate or had left his property to his brothers and the only sister who had not yet taken the veil, *per stirpes*, in equal shares.

The heirs were thus his brother Michael, the son of his brother Martin, the sons (jointly) of his brother Stephen, and his sister Ursula, the wife of Ulrich Futterer.

Young Martin had thus become entitled to a fourth share, or to a total sum of about 350 gulden, as declared repeatedly by his uncle Michael. I have carefully read the legal document referred to, and cannot agree with Dr. Günther (p. 71) when he suggests that Wolfgang left to his nephew the *whole* of his share in the house on the market, "because of qualms of conscience felt on account of the heartless manner in which he had condemned his 'learned brother.'"⁷

Martin Behaim, on July 1 aforesaid, declared that he had sold his share of the house in the market square to his uncle Michael in consideration of his cancelling the debt which he owed him for various advances made to him up to that time.⁸ The declaration does not mention the amount of the advances "paid and granted," but it must have exceeded 100 gulden. Furthermore Martin declared that he had received 250 gulden, being one fourth share of the remaining assets of his uncle Wolfgang. The money secured in this manner was laid out in wax, which Jorg Pock hoped would turn out a profitable speculation.⁹

Sent to a Schoolmaster.

Upon the settlement of the legal business Martin presented a hatchment and candelabrum to the Church of

¹ For a copy of this Bill of Exchange see Ghillany, p. 110.

² Ghillany, p. 117. An account of the money laid out at Antwerp between May 12-27 on behalf of Martin Behaim is still to be found in the Family Archive.

³ Michael Behaim's letter, December 16, 1518 (Ghillany, p. 44).

⁴ Uncle Michael repeatedly expressed a wish to send to this lady, for whom he expressed a high respect, an "acceptable present" (*verehrung*). See, for instance, his letter of November 5, 1518 (Ghillany, p. 111).

⁵ Pock (Ghillany, p. 118) mentions "gut mermalada kütten lattwergen unnd anders." Marmalade may, of course, be made of various fruits, but in Portugal it is usually, if not always, made of quinces.

⁶ Lazarus Nürnberger had returned from India in 1518, bringing with him an ointment supposed to be an excellent remedy for Michael Behaim's gout. In March, 1520, he was back at Lisbon, and in 1521 went out to India for a second time. (Pock's letter of December 16, 1518, and March 27, 1520; Ghillany, pp. 113, 118.)

⁷ See p. 51.

⁸ "Wan er Im ein Nemliche summa gulden dero er von Im gar In seinen Nutz bezalt, gewerbt, und darumb benüßig were."

⁹ Pock, March 27, 1520 (Ghillany, p. 118).

St. Catherine in commemoration of his father, after which he was sent to a schoolmaster at Bamberg to learn German and commercial arithmetic,¹ for his relatives were ashamed that so old a "boy" should not have acquired these accomplishments in his youth. It was intended eventually to establish him in the Netherlands or at Lisbon as a "factor,"² or commercial agent. But when his Portuguese relatives were made acquainted with this project, they most strongly objected to his being sent to Lisbon, saying that it would disgrace them, as Martin's father had been a highly esteemed (hochgehalten) gentleman and a knight.³ Jorg Pock, who, of course, was not in sympathy with these narrow views, nevertheless objected to his being sent to Lisbon, as his friends there would most certainly try to live upon him, and as the trade of Lisbon was moreover going down, whilst that of Seville was rapidly increasing. He suggested that it might on these grounds be better to provide for him in Castile.

¹ Pock, December 1519 (Ghillany, p. 117).

² A "factor" is the agent of a firm established abroad and commissioned to buy and sell goods on its behalf. He receives no salary, but a commission in lieu thereof.

³ Behaim's letter of December 16, 1518, and Pock's of March 27, 1520 (Ghillany, pp. 113, 118). In 1434 King Ferdinand had prohibited knights, priests and men of position to engage in business, so as not to injure the merchants. Fernão Lopez, 'Chronicle do Re Ferdinand I. ('Medios de historia Portuguesa,' IV., 127).

Return to Portugal.

But even before the arrival of Jorg Pock's letter of March 27, 1520, which conveyed the earnest protest of Martin's Lisbon friends, the fate of the young man had been decided. He had evidently disappointed the expectations of his uncles, and having secured a second letter from the Senate of the same tenor as the first, except that no reference was made to the homicide, and dated May 12, 1520,⁴ he was sent back to his aunt. His stay at Nuremberg had therefore not exceeded a year. Whether the letter he carried away with him helped him to an appointment in the King's household history doth not tell. With him the Portuguese line of the Behaims seems to have died out. Ernesto do Canto ('Arquivo dos Açores,' VII., p. 401) knew of no descendants of his in the Azores.

The German line, however, survives to the present day, and the gloomy forebodings of Michael Behaim have not yet been realised.⁵

FLOREANT IN PERPETUUM!

⁴ For a translation of this letter see Appendix XII., p. 115.

⁵ The Nuremberg branch of the family is at present represented by Friedrich, Freiherr von Behaim (b. 1854), senior familiae, a bachelor, his younger brother, Wilhelm (b. 1867), the father of four children—three daughters and one boy (b. 1891).





BEHAIM'S GLOBE AT NUREMBERG IN 1905.

THE GLOBE.

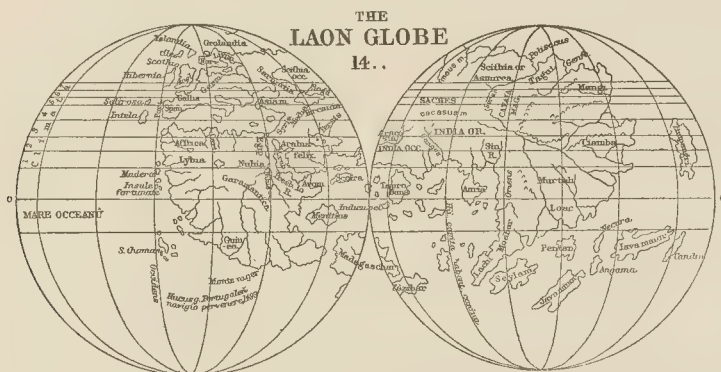
XVII. THE HISTORY OF THE GLOBE.

Contemporary Globes.

MARTIN BEHAIM's stay at Nuremberg in 1490-96 is memorable for the production of a globe with which his name is identified, and which has secured for him a place in the history of geography. Globes in his age, and even earlier, were by no means unknown. Giovanni Campano, a distinguished mathematician of Novara, who flourished in the time of Pope Urban IV. (1261-64), wrote a 'Tractatus de Sphera solida,' in which he describes the manufacture of globes of wood or metal.¹ Toscanelli, when writing his famous letter in 1474, refers to a globe as being best adapted for demonstrating the erroneous hypothesis as to the small distance which he supposed to separate the west of Europe from Eastern Asia. Columbus, too, had a globe on board his vessel upon

two globes of a date anterior to the discovery of the New World remain to us, namely, that still preserved at Nuremberg, and a smaller one at the Dépôt des planches et cartes de la marine, Paris.

The latter, known as the "Laon Globe" because M. Léon Leroux picked it up, in 1860, in a curiosity shop of that town, has been described by M. d'Avezac ('Bull. de la Soc. de Géographie,' XX., 1860). It is of copper gilt. Its diameter is 170 mm., and it seems originally to have formed part of an astronomical clock-work. The design of this globe dates back to a period even anterior to the age of Prince Henry the Navigator, but as the names "S. Thomas" and "Mons Niger" [Cão's "furthest" in 1485], and the legend "Hucusq: Portugalen: navigio: pervenere: 1498" are to be read upon it, it has been supposed that this globe, notwithstanding its antiquated geographical features, is in reality no older than the year named. I am not prepared to



which was depicted Cipangu,² and which may have been the work of his brother Bartholomew, who, according to Las Casas, produced charts as well as globes. But only

accept this explanation; I am rather inclined to think that the above legend was added long after the completion of the globe, this being a cheap and ready means of bringing it up to date, a proceeding by no means unknown among modern map publishers. But however this may be, this "Laon Globe" is too small to enter into competition with the fine globe produced at Nuremberg in 1492.

¹ Fiorini, 'Sferi terrestri e celesti di autore Italiani' (Rome, 1899), p. 40. M. Fiorini was born at Felizzaro in 1827 and died 1901 at Bologna, where he was Professor of Geography.

² Journal, September 24, 1492.

George Holzschuher's Suggestion.

We are indebted to the public spirit and the interest taken in geographical discoveries by the chief magistrates of Nuremberg for the production of the globe now under review. The idea of executing such a work was proposed to Martin Behaim by the three "chief captains" or "triumviri" of the Imperial city. They appear to have done so at the suggestion of George Holzschuher, a member of the City Council, who had visited Egypt and the Holy Land in 1470. As a far-travelled man he may thus be supposed to have taken an interest in geographical matters, an interest enhanced by the discoveries reported to have been made by the Portuguese, and their commercial advantages, of which members of his family at a later period fully availed themselves. At all events, George Holzschuher¹ was entrusted by the City Council with the supervision of the work, and in the legend surrounding the city arms, his "help and advice" in producing the globe are acknowledged.

Behaim's Qualification.

With regard to Behaim's qualification for the task committed to him, I shall have much to say in a future chapter. I may, however, state at once that I agree with Oscar Peschel,² who calls him a "cosmographical dilettante." It is quite possible, nay, probable, that Behaim took some interest in geographical subjects, that he may even have drawn maps, but we know nothing concerning him which would entitle us to describe him as a "great cosmographer" or an innovator in applied astronomy. His utter failure to portray the results of contemporary Portuguese discoveries upon his globe seems to me to be conclusive in that respect. I would rather class him with a man like Richard Thorne, an English merchant residing at Seville, who in 1527 sent a map illustrating the progress of Portuguese and Spanish discoveries to Dr. Edward Leigh, the ambassador of Henry VIII., for the "rudeness" of which Hakluyt apologises on the ground that "the knowledge of cosmography among our merchants not having been as great then as it now is."³

The Manufacture of the Globe.

We are happily in a position to follow the mechanical production of the globe through all its stages, for the accounts rendered by George Holzschuher to the town council have been preserved and have been published by Dr. J. Petz, the secretary of the Nuremberg city archives.⁴

The production of the globe involved *first* the compilation of a map of the world as a guide for the artist employed in painting the globe; *secondly*, the manufacture of the globe, together with its accessories; *thirdly*, the transfer of the map to the globe.

The compilation of a "printed mappa mundi, which was used for the globe," naturally fell to the share of Behaim himself. It cost the town council only £1 3s. 7d.,⁵ out of which 13s. 7d. was paid to Behaim himself (probably for expenses out of pocket) and 10s. to a limner. This map was subsequently mounted upon two panels, framed and varnished, at an additional expense of £1 1s. 4d. and hung up in the clerk's office (Kanzlei) of the town hall. Johann Schöner, in 1532, was paid £5 for "renovating" this map and for compiling a new one, recording the discoveries which had been made since the days of Behaim.

The manufacture of a hollow globe or sphere can hardly have presented any difficulty at Nuremberg, where the traditions of the workshop of Johann Müller (Regiomontanus),⁶ who turned out celestial spheres, were still alive.

The mould or matrix of loam was prepared by a craftsman bearing the curious name of Glockengiesser—bell-founder. The spherical shell was the work of Kalperger. Having covered the mould with successive layers of paper, pasted together so as to form paste-board, he cut the shell into two hemispheres along the line of the intended Equator. The hemispheres were then taken off the mould, and the interior having been given stability by a skeleton of wooden hoops,⁷ they were again glued together so as to revolve on an iron axis, the ends of which passed through the two poles. The sphere was then coated with whiting, upon which was laid the vellum which was to bear the design. The vellum was cut into segments resembling the gores of a modern globe, and fitted the sphere most admirably. A smith supplied two iron rings to serve as meridian and horizon, a joiner a stand, and there was provided a lined cover as a protection against dust. All this only cost £3 7s. 7d., of which £1 was paid for the mould, £1 10s. 0d. to Kalperger, 3s. 2d. for vellum; 5s. for the iron rings; a like sum for the stand, and 4s. 5d. for the cover. Kalperger, however, was not paid the 3 gulden which he claimed for making the shell; for he had been given the linen of a tent which had sheltered the "beautiful fountain" (during repairs); he had moreover broken the first mould which Glockengiesser had made, and lastly he had promised to forgo his claim if Behaim would teach him "cosmography and the laying out (austeilen) of the sphere."⁸

⁵ The gulden Rhenish contained 8 lb. 12 heller, and was worth about 10s.

⁶ Regiomontanus, 'Epytoma in almagestum ptholemaei' (Venice, 1496), describes the manner of making these globes.

⁷ Ghilany, p. 73, mentioned these hoops. He depended for this information upon Karl Bauer.

⁸ Dr. Günther ('Erd- und Himmelsgloben von M. Fiorini bearb. von S. Günther,' p. 27) would have us look upon this Kalperger as the "Forefather of the guild of German globe-makers," but surely that honour, as far as Nuremberg is concerned, is due rather to Johann Müller.

¹ George Holzschuher was a member of the City Council from 1484 to 1514. He died in 1526.

² 'Zeitalter der Entdeckungen,' 1877, p. 486.

³ R. Hakluyt, 'Divers Voyages,' 1582, republished by the Hakluyt Society in 1850.

⁴ 'Mittheilungen d. Ver. f. d. Gesch. d. Stadt Nürnberg,' Heft VI., 1886, pp. 168, 170, 172, reprinted with a translation in Appendix VII.

In 1510 the iron meridian was displaced by one of brass, the work (as suggested by Murr, p. 19) of Johann Werner, the astronomer, for which £4 10s. was paid. The wooden stand was superseded about the same time by an elegant tripod of iron.

The important duty of transferring the map to the surface of the globe and illuminating it was entrusted to Glockenthon.¹ This artist spent fifteen weeks over this work, for which he was paid £7.² In addition to this his wife was awarded 10s., and both were supplied with dinners at an additional expense of at most 10s., though wine and beer were included.

All in all, and including Kalperger's claim, this fine work of art cost the city no more than £18 17s.

For over a hundred years the globe stood in one of the upper reception rooms of the town hall, but in the beginning of the sixteenth century it was claimed by and surrendered to Baron Behaim.³ This was fortunate, for had it remained, uncared for, in the town hall it might have shared the fate of so many other "monuments" of geographical interest, the loss of which the living generation has been fated to deplore. In November 1907 the globe was removed from Baron W. Behaim's family mansion in the Egydienplatz to the Germanic Museum.

Repairs of the Globe.

The globe, in its pristine condition, with its bright colours and numerous miniatures, must have delighted the eyes of a beholder. In the course of time, however, the once brilliant colours darkened or faded, parts of the surface were rubbed off, many of the names became illegible or disappeared altogether. The mechanician Karl Bauer, who, aided by his son Johann Bernhard, repaired the globe in 1823, declared to Ghillany, that it had become very friable (*mürbe*), and that he found it difficult to keep it from falling into pieces. In his opinion it could not last much longer.⁴ Yet the globe has survived, and its condition seems in no manner worse than it was when it was under treatment by the Bauers. Indeed, on examining the globe, a beholder may feel surprise at the brightness of much of the lettering. This, however, is due to the action of the "renovators," who were let loose upon the globe in 1823, and again in 1847; who were permitted to work their will without the guidance of a competent geographer, and, as is the custom of the tribe, have done irreparable mischief. As a result numerous place-names have been corrupted past

recognition, and Dr. Scheppig is quite right when he maintains that if we desire to recover the original nomenclature of the globe we must deal with it as a palimpsest. Such a process, however, might lead to the destruction of the globe, whilst the result possibly to be achieved would hardly justify running such a risk.

A General Description.

The globe has a circumference of 1,595 mm., and consequently a diameter of 507 mm., or 20 inches. Only two great circles are laid down upon it, viz., the Equator, divided into 360 degrees, and the Ecliptic studded with the signs of the Zodiac. The Tropics, the Arctic and the Antarctic circles, are likewise shown. The only meridian, is drawn from Pole to Pole 80° to the west of Lisbon. The sea is coloured a dark blue, the land a bright brown or buff with patches of green and silver, representing forests and regions supposed to be buried beneath perennial ice and snow. Perhaps the most attractive feature of the globe consists of 111 miniatures, for which we are indebted to Glockenthon's clever pencil. The vacant space within the Antarctic circle is occupied by a fine design of the Nuremberg eagle with the virgin's head, associated with which are the arms of the three chief captains by whose authority the globe was made, namely, Paul Volekamer, Gabriel Nützel and Nikolaus Groland, of Behaim and Holzschuher. There are in addition 48 flags (including 10 of Portugal) and 15 coats of arms, all of them showing the heraldic colours. The miniatures illustrate a great variety of subjects. Forty-eight among them show us kings seated within tents or upon thrones; full-length portraits are given of four Saints (St. Peter, St. Paul, St. Matthew and St. Iago), of missionaries instructing natives and of travellers. Eleven vessels float upon the sea, which is peopled by fishes, seals, sea-lions, sea-cows, sea-horses, sea-serpents, mermen and a mermaid. The land animals include elephants, leopards, bears, camels, ostriches, parrots, and serpents. Among the animals represented we miss flying fish and whales, which Behaim must have observed even if he got no further than the Gulf of Guinea. Even more curious is Behaim's faulty representation of the Portuguese arms. Such a mistake may be forgiven to Italians like Bartholomeu di Pareto (1455) or Nicolas de Canerio (1502), but Behaim had resided for years in Portugal and had repeatedly sailed in Portuguese ships.⁵ The only fabulous beings which are represented among the miniatures are a merman and a mermaid near the Cape Verde Islands, and two Sciapodes in central South Africa, but syrens, satyrs and men with dogs' heads are referred to in some of the legends. Nor do we meet with the "Iudei clausi," or with a "garden of Eden," still believed in by Columbus. This is a commendable forbearance in an age which still rejoiced in "mirabilia."

¹ No doubt George Glockendon, sen., a well-known illuminator, who is the author of a road map ("Das ist der Romweg") and, jointly with Erhard Etzlaub, a well-known mathematician and maker of sundials, of a map of the environs of Nuremberg. He died in 1514.

² Or at the rate of about 1s. 6d. a day. The "writers" employed at Venice, in 1457-8, in copying Fra Mauro's map for the King of Portugal were paid 120-140 soldi or 1s. to 1s. 2d. (Zurla, p. 84).

³ See J. Müllerner's 'Annalen.'

⁴ Ghillany, p. 73.

⁵ Compare the coat of arms p. 21, with that of the globe.

The globe is crowded with over 1,100 place names and numerous legends in black, red, gold or silver. The author has not always been happy in the selection of these names. Even in Germany we miss such names as Hamburg, Lübeck, Antwerp, Brügge, Cologne and Frankfurt. Another curious omission is that of the island of Malta, which is likewise omitted by Giovanni Leardo (1448) and Waldseemüller (1507). A peculiar feature is the uncalled-for duplication of many place names.

XVIII. FACSIMILES OF BEHAIM'S GLOBE.

Facsimiles in Solido.

AMONG the "facsimiles" of Behaim's globe there is only one which can honestly be described as such. I refer to the exact copy of the globe which, at the suggestion of E. F. Jomard¹ was made in 1847 for the Bibliothèque Nationale at Paris. This work was carried on under the supervision of Albrecht Reindel,² Director of the School of Art. During its progress the atelier was twice visited by Dr. A. E. Cropp³ of Hamburg (introduced by Dr. Ghillany), who met there the mechanic Bauer of the Schildgasse, and a young man (probably Jean Müller), who were busily at work upon the globe. He noticed that although much of the lettering had been renovated and was quite legible, the artist was unable to decipher many of the names. In cases of this kind recourse was had to Doppelmayer's facsimile, Sebastian Münster's 'Cosmographia,' and to a map drawn on vellum. This map I believe to have been referred to by Ch. G. von Murr (p. 20) when he tells us "there is to be found in said archive (of the Behaim family) a fairly correct and neat copy of this globe upon two rolls of parchment." Dr. Cropp directed the attention of Director Reindel to the fact that upon this parchment map the words "Insula Antilia genannt septe ritade" were erroneously written against St. Brandan's Island, and that this erroneous description had already found a place upon the facsimile of the globe. On a closer examination traces of the words "Insula de Sant Brandan" were discovered and the error corrected.

On the completion of the facsimile the following

¹ Edme François Jomard, the distinguished French geographer, was born at Versailles in 1777. He was appointed in 1828 Keeper of the Bibliothèque Nationale, and died in 1862.

² A. Reindel, a famous engraver and artist, was born at Nuremberg 1784 and died there in 1852.

³ Dr. Cropp's remarks, for a copy of which I am indebted to the kindness of Dr. Scheppig, were discovered in Ghillany's 'Der Erdglobus des Mart. Behaim' (Nürnberg, 1842) in the Hamburg "Commerz-Bibliothek." Dr. Cropp was told that Jomard paid 800 fl. (1660 frs.) for this copy.

procès-verbal was drawn up and signed by desire of M. Jomard.⁴

"M. le baron de Behaim présentement vivant, le possesseur actuel du globe, l'a confié au directeur de l'école des arts de Nuremberg, M. Reindel.

"Celui-ci a fait faire une monture entièrement conforme à l'original ainsi que les autres pièces accessoires; ensuite il a chargé un habile artiste de la ville de faire une copie, la plus exacte possible, à l'aide de décalage, non seulement des contours des pays, mais aussi des écritures et des autres signes, figures et ornements qui se trouvent sur l'original, avec le coloriage entièrement conforme à celui du modèle.

"Ensuite de quoi, le Recteur de l'école polytechnique d'ici, M. le Dr. Ohm,⁵ a encore été invité spécialement à constater, par une comparaison attentive, la fidélité de la copie, et à l'attester par son témoignage. Ce dernier a reconnu entre la copie et l'original un accord aussi complet qu'il était humainement possible de l'obtenir.

"La vérité de ce qui précède est certifiée ici par les trois personnes susnommées chacun pour ce qui le concerne, avec l'apposition de leurs sceaux et signatures.

"Fait à Nuremberg, le premier août mil huit cent quarante-sept.

(Signed) "Frédéric Carl, baron de Behaim, senior familiae.

Albrecht Reindel, directeur de l'École des arts, conservateur du Musée de Nuremberg, etc.

D. Georges Simon Ohm, directeur de l'École polytechnique, membre de l'Académie des sciences."

I, too, have compared the Paris facsimile with the original, and although in the main I cordially agree with the favourable estimate formed as to the conformity between the original, and of all its accessories, and the copy made at the art-school, I have discovered a few sins of commission and omission which ought not to have escaped the eye of a careful examiner. Such a one would quickly have missed the skeleton-flags floating over Fayal, the tent of the King of Mangi, and a paragraph of the legend giving an account of the Indian spice trade. On the other hand quite a number of names have found a place upon the Paris copy which are looked for in vain upon the original and were utterly unknown even to the most learned cosmographers at the end of the fifteenth century. Among such names are Havre de Grace, only founded in 1515, Chiwa, Canton and Peking, the last two placed within brackets and identified with Zaitun and Kambalu! The Nuremberg artist, perhaps at the suggestion of one of his scientific advisers, has likewise attached

⁴ Published by J. Codine ('Bull. de la Soc. de Géographie,' Paris, March, 1876).

⁵ G. S. Ohm, the famous discoverer of Ohm's law, was born 1787 at Erlangen, 1833-48 Director of the Polytechnic School at Nuremberg, died 1854 as Professor of Physics at Munich.

modern names to a number of rivers which are nameless upon the globe. Thus, three rivers entering the Hyrcanian Sea (Caspian) are named Jemba, Sir and Amu,¹ usually known in those days by their ancient names of Daix, Jaxartes and Oxus. Three rivers in North-eastern Asia he rashly identifies with the Lena, the Kolyma and the Amur, apparently quite unaware of the fact that the Russian fur-hunters only reached the Lena in 1628 and the Amur in 1648. Further south two rivers are named Menam-ken (J 5 s) and Menam fl. (J 11 s), which the artist believed to represent the Me-kong and the river of Siam, which certainly became only known (at all events by these names) many years after the completion of the globe. There are minor discrepancies between the original and the copy made for the Bibliothèque Nationale, but what has been stated proves that the collation was not as thorough as the certificate printed above would lead us to believe.

In 1892 M. Gigot de Grandpré, under the direction of Mr. H. Vignaud, made a copy of the Paris globe, which was exhibited at Chicago and is now in the National Museum at Washington. It only cost 2,000 francs.

A third facsimile *in solido* was produced by order of the Portuguese Commission² for the Centenary of the discovery of America which was celebrated at Madrid in 1892. It is the work of a clever lady artist, S^a. Casanova, but is decorative merely, and has no claim to accuracy.

Pseudo-Facsimiles in plano.

The earliest of these facsimiles was published by J. G. Doppelmayr, in 1770. It is on a globular projection and on a small scale (diam. 196 mm.), but compensates for a paucity of place names by having most of the legends of the globe engraved in its broad margins. Even in Doppelmayr's day the lettering of the globe appears in part to have been difficult to decipher. Doppelmayr's reading near the Pole, "hie findet man weises volk" (here are found white people), is corrected by Murr into "hie fecht man weissen valcken" (here are caught white hawks). Similarly, Puini should evidently read Permi (Permians) and minupias Menuthias. The island antilia has been overlooked. The words Polus arcticus and antarcticus, although also given by Murr, are not to be discovered on the original.

Christoph Gottlieb von Murr, in his 'Diplomatische Geschichte des Ritters Martin Behaim' (First edition, Nuremberg, 1778), published a facsimile of that part of the globe which lies between Gran Canaria and Asia. Murr (p. 26) describes this as "an exact copy on the actual size of the globe," when, as a matter of fact, it is a mere sketch, on a globular projection, having a diameter of 520 mm. On this facsimile the meridian distance between Gran Canaria and the eastern horn of Asia (Zeitun)

amounts to 100°, instead of 118° as on the original; Murr altogether omits the meridian, which is drawn about 15° to the east of Cipangu, and its legends. On the other hand he numbers the degrees along the Equator, and names the "Tropicus cancri" and "Tropicus capricorni," the "Polus arcticus" and "Polus antarcticus," neither of which is done on the original.

I shall next deal with the facsimiles published by Dr. F. W. Ghillany in 1853 ('Geschichte des Seefahrers Ritter Martin Behaim'), and E. F. Jomard in 1854 ('Monuments de la Géographie'), and I shall do so at some length, as up to 1894, when Prof. H. Wagner³ exposed their shortcomings, they were looked upon as trustworthy copies made direct from the globe. Indeed, Ghillany (pp. III.) claims to give, for the first time, a complete draft, the size of the "globe itself, and all that is found on it in faithful facsimile." He assures us (p. 72) that "the various legends have been introduced literally (wortgetreu)." These assertions prove that although Ghillany is known to have seen the globe, he can never have carefully examined it. Jomard did not live to write the text which was to accompany his 'Monuments.' When he died in 1862, the materials collected by him were handed over to M. d'Avezac, after whose death in 1875 they were entrusted to E. Cortambert, who merely published a short 'Introduction à l'Atlas des Monuments de la Géographie' (Paris, 1879). Ultimately d'Avezac's effects were handed over to his nephew, Count Jules Boselli, since which time the original, from which Jomard's facsimile was copied, has not been seen. This original I venture to identify with the two parchment rolls referred to by Murr as containing a "fairly correct and neat copy of the globe,"⁴ and which were also seen by Dr. Cropp, who noticed that St. Brandan's Island had erroneously been named Antilia. The original rolls I presume were forwarded to Jomard, who accordingly retained the erroneous designation of St. Brandan's Island, omitting Antilia altogether. A copy, however, was retained from which Jean Müller subsequently produced Ghillany's facsimile. Upon this facsimile the mistake as to Antilia and St. Brandan, which had been pointed out by Dr. Cropp, was corrected.

The assumption that the "facsimiles" published by Ghillany and Jomard are copies of the same original is irrefutable. They are both on a globular projection and on the same scale; they both ignore the existence of a first meridian and its legends, and place the signs of the Zodiac differently from the original; show an equatorial gulf penetrating for 900 geographic miles into Eastern Africa; duplicate the names Catabeda and Copicora (topierra),⁵ describe the south-western cape of Africa as Caput bona

³ 'Die Rekonstruktion der Toscanelli-Karte' ('Nachr. d. K. Gesellsch. d. W.' Göttingen, 1894).

⁴ See page 60.

⁵ First, correctly, to the south of the Ganges, secondly on Sinus magnus.

¹ On the Catalan Map, 1375, the Oxus is called *fl. amo*.

² "Centenario do descobrimento de America," 'Memorias da Commissão Portugeza' (Lisbon, 1892).

Spei. About a dozen miniatures have been omitted, but those which remain have evidently been copied from the globe itself. On the other hand, Jomard as well as Ghillany gives us five miniatures not to be discovered on the original; namely, a kneeling figure at the northern extremity of Scotland; a Venetian lion off Constantinople; Royal Tents at Saba in Arabia, in Abasia on the southern tropic, in Africa, and in Thebet (K 37), in Asia. Jomard, in addition to this, figures a griffon to the west of this tent. There are likewise a few additional place names. But these, as well as the astoundingly corrupt spelling of many others, I shall deal with in the chapter describing the "Nomenclature of the Globe."¹

My own "Facsimile."

Fully conscious that a true facsimile of a globe can be produced only as a sphere (in rotundo) or in gores or segments such as with a little management can be fitted to a sphere, and the former course being out of the question in the case of a publication like mine, I chose the latter. My facsimile thus includes 13 segments, viz., 11 of 30 degrees and 2 of 15 degrees, as also two segments for the polar regions. The scale is that of the original.

Having made a copy of the globe at Paris, with the aid of tracings and photographs by M. P. Sauvenard,² and excellent sketches of the miniatures by Mlle. Henrietta Bressler, I took that copy to Nuremberg, and was permitted on two occasions in 1899 and Christmas, 1904, to collate it with the original. Baron Behaim, moreover, permitted Prof. N. J. Rackl to examine the globe on several occasions on my behalf, in elucidation of doubtful points which arose in the course of my work.

It was my intention at one time to correct the corrupt spelling of place names on the facsimile itself, but I found this to be a hopeless and unprofitable task, and gave it up. I have, however, dealt with this subject fully under "Nomenclature," where will be found not only the various "readings" of conflicting authorities, but also the correct spelling, as far as possible.

On the facsimile itself I have inserted a number of names which I found on the facsimiles referred to, and which may originally have been on the globe itself. Names of this kind I have placed within brackets. Such names, however, as Havre-de-Grace, Amur, Menam, Pekin, etc., which owe their presence to the spurious erudition of renovators, I have omitted.

¹ All other "facsimiles" of the globe are derived from those mentioned and described. They are by Heidelof, western hemisphere only, diameter 172 mm., published by Ghillany in 1842; by J. Lelewel, diameter 114 mm. ('*Géographie du moyen âge*, Atlas, Plate 40), 1850; by the same, diameter 111 mm. ('*Épilogue*'), 1857; Vivien de Saint-Martin, a reduction from Jomard, diameter 134 mm. ('*L'histoire de la Géographie*, Atlas), 1874; S. Ruge, western hemisphere, diameter 280 mm. ('*Zeitalter der Entdeckungen*'), 1881; S. Günther, western hemisphere, diameter 139 mm. ('*Martin Behaim*'), 1890.

² He had been a prisoner of war of Dresden and carried away with him grateful memories of that beautiful city.

It was originally my intention to publish this facsimile in a simple manner, but my publishers, with a generosity not very general, insisted upon elaborate colour printing, the execution of which they entrusted to Mr. Griggs, whose reputation for this class of work is world-wide.

Of course, I am fully aware that if the definition of etymologists of a facsimile³ as an "exact copy or likeness" be insisted upon, the copy or version now produced cannot claim that description. I trust, however, that, notwithstanding its many shortcomings, it will prove acceptable to students and antiquaries alike.

XIX. THE SOURCES OF BEHAIM'S GLOBE.⁴

BEHAIM informs us in one of the legends of his globe that his work is based upon Ptolemy's *Cosmography*, for the one part, and upon the travels of Marco Polo and Sir John Mandeville, and the explorations carried on by the order of King John of Portugal, for the remainder. Other sources were, however, drawn upon by the compiler, and several of these are incidentally referred to by him or easily discoverable, but as to a considerable part of his design I have been unable to trace the authorities consulted by him.

Ptolemy.

With respect to Ptolemy, Behaim has been guided by the opinion of the "orthodox" geographers of his time and has consequently copied the greater part of the outline of the map of the world designed by the great Alexandrian. He has, however, rejected the theory of the Indian ocean being a "mare clausum," and although he accepted Ptolemy's outline for the Mediterranean, the Black Sea and the Caspian, he substituted modern place names for most of those given by ancient geographers. The edition of Ptolemy of which he availed himself was that published at Ulm in 1482, and reprinted in 1486, with the maps of Dominus Nicolaus Germanus.

Isidor of Seville.⁵

Isidor of Seville, or one of his numerous copyists, is the authority for placing the islands of Argyra, Chryse and Tylos far to the east, to the south of Zipangu, as also for a reference to syrens and other monsters of the eastern ocean. Behaim, in a legend (M 7) refers for further

³ Captious critics will possibly charge me with a "terminological inexactitude" for daring to use the word "facsimile."

⁴ Letters and figures within brackets refer to the gores and latitudes of my facsimile, viz., (A 20) stands for gore A, lat. 20°.

⁵ Isidor of Seville was born about 560 and died Bishop of Seville in 624. He is the author of an encyclopaedic work, '*Originum sive etymologiarum libri XX.*' which enjoyed much authority during the Middle Ages. This work contains a '*Liber monstrorum*' (see K. Miller, '*Die ältesten Weltkarten*', VI., Stuttgart, 1898).

information on this subject to Pliny, Aristotle, Strabo and the 'Specula' of Vincent of Beauvais.¹ The last, however, merely copied Isidor, whilst the others named did not believe in these monstrosities.

Marco Polo.²

If the reader examines Map 2, where the information derived from Marco Polo is printed in red, he cannot fail to be struck by the extent to which the author of the globe is indebted to the greatest among mediæval travellers. Accounts, in MS., of Polo's travels in Latin, French, Italian and German, were available at the time the globe was making at Nuremberg, as also three printed editions. The earliest of these, in German, had appeared in 1477 at Nuremberg;³ a Latin version, from a translation made by Friar Francisco Pipino of Bologna in 1320, had been published at Antwerp in 1485;⁴ and an Italian version printed at Venice by Z. Bapt. da Sessa in 1486. Neither the German nor the Italian version is divided into books and chapters. Pipino's Latin version, on the other hand, is divided in this manner, and Behaim in seven of his legends quotes these divisions correctly. We should naturally conclude from this that this was the version consulted if on other occasions he had not quoted the chapters as given in the version which was first printed in Ramusio's 'Navigazioni e viaggi' in 1559.⁵ If we add that many proper names are spelt sometimes according to Pipino's version and at others according to that of Ramusio, and that in several instances names are inserted twice upon the globe and separated by hundreds of miles, we may fairly conclude that we have not before us an original compilation, but an uncritical combination of two separate maps designed to illustrate Marco Polo's travels, whose authors, not being skilled cartographers, differed widely as to the localisation of the places visited or described by the Venetian traveller. Two instances of this duplication of place names may be referred to. *Bangala*, the well-known province at the mouth of the Ganges, is placed once in the very centre of Cathai (K 43) and a second time to the east of the Indus (G 15), both positions being absolutely erroneous. *Vocan* (Wakhan) likewise appears twice, once in Bactriana (G 39) (which is fairly correct), and a second time to the east of the Ganges (H 26). Instances of such duplication might be multiplied.

¹ Vincent of Beauvais, a learned Dominican, and tutor of Prince Philip, the son of Louis IX., was born before 1194. He died in 1264.

² Marco Polo was born 1250. He left Venice with his father and uncle in 1271. The three travellers returned to Venice in 1295. Marco Polo dictated a narrative of his travels whilst a prisoner of war at Genoa. He died in 1324.

³ 'Hie hebt sich an das buch des edeln Ritters vn landtfarers Marcho Polo, Nuremberg (F. Creusner), 1477.

⁴ 'Incipit prologus in Libro domini marci pauli,' Antwerp (G. de Leen), 1485. A 3rd edition of Yule's 'Marco Polo,' by H. Cordier, appeared in 1903.

⁵ Giambattista Ramusio, the learned editor of these 'Navigazioni,' was born in 1486 and died in 1567. He was engaged upon his great work from 1523 to his death, but only its first volume was published in his lifetime.

Marco Polo's Routes plotted.

I have thought it worth while to plot the routes travelled or described by Marco Polo in order to exhibit at a glance the seriously incorrect delineation of Eastern Asia on Behaim's globe, and in the maps of his contemporaries and successors, whose authors may have been "men of science," but who certainly were most incompetent cartographers.

In plotting Marco Polo's routes I start from Ormus (Armuz). I accept Ptolemy's latitude for that place (28° 30'), but not his longitude. Assuming the Straits of Gibraltar (Herculeum Fretum) to lie four degrees to the east of Lisbon, the meridian difference between the Straits and Beirut to amount to 41 degrees, as warranted by the examination of the Portolano charts, Beirut would be situated in longitude 45° east of Lisbon. Adding 28 degrees for the difference of longitude between Beirut and Ormus (according to Ptolemy), I locate the latter 73 degrees to the east of Lisbon.

Starting from Ormus I plotted the routes of Marco Polo, as described in his narrative, as carefully as possible, and without allowing myself to be biased by information brought home by earlier or later travellers. Twenty Roman miles have been allowed for each day's land journey, and the result is shown on Map 3. A comparison of this sketch with Behaim's globe, or indeed with other maps of the period, even including Schöner's globe of 1520,⁶ shows clearly that a much nearer approach to a correct representation to the actual countries of Eastern Asia could have been secured had these early cartographers taken the trouble to consult the account which Marco Polo gave of his travels. India would have stood out distinctly as a large peninsula. Ceylon though unduly magnified would have occupied its correct position, and the huge peninsula beyond Ptolemy's "Furthest," a duplicated or bogus India,⁷ would have disappeared, and place names in that peninsula, and even beyond it, such as Murfuli, Maabar, Lac or Lar, Cael, Var, Coulam, Cumari, Dely, Cambaia, Serenath, Chesmakoran and Bangala would have occupied approximately correct sites in Polo's India maior.

Marco Polo's account is perfectly clear as to the peninsular shape of India. Already at Pentam and Java minor he had lost sight of the Pole star, which proves that he then believed himself to be near the Equator, if not to the south of it. He then takes a westerly course to Maabar, sails for 500 miles to the south-west, doubles the southern extremity of India, and once more perceives the Pole Star when 30 miles beyond Cumari. Following the coast in a north-westerly direction, the star rises higher and higher, its altitude, at Guzurat, being already six cubits.

The islands which extend from Madagascar eastward

⁶ And even the world maps of such distinguished geographers as Petrus Apianus (1540) and Simon Grynaeus (1532). Schöner was content to copy Waldseemüller's map of 1507.

⁷ This duplicated India includes, in fact, India proper, the Malay peninsula (Aurea chersonesus or Chryse) and Indo-China.

as far as Candyn are named and described by Marco Polo, Candyn alone excepted, but the outlines given to them, and still less the duplicated India, cannot possibly have been copied from a map furnished or authorised by the Venetian traveller. Such a map, it is believed, was prepared in the time of Duke Francesco Dandolo (1329-39) soon after the death of Marco Polo, and it still hangs in the Sala dello Scudo of the Ducal Palace. This map, however, was renovated under the supervision of Giambattista Ramusio during the reign of Duke Francesco Donato (1545-53),¹ and even in its original state it cannot have represented the views of Marco Polo. Cambalu (Peking), for instance, which Marco Polo describes (Pipino's version II. 19.) as being situated within two days' journey of the ocean, is placed on that map more than 1,600 geographical miles inland.

The only contemporary map upon which the delineation of Eastern Asia including the place names is almost identical with that given on Behaim's globe is by Waldseemüller, and was published in 1507 (see p. 36).² We may conclude from this that both Behaim and Waldseemüller derived their information from the same source, unless, indeed, we are to suppose that the Lotharingian cartographer had procured a copy of the globe which he embodied in his own design. A comparison of the two shows, however, that such cannot have been the case, for there are many names upon the map which are not to be found on the globe. The source or sources of this delineation of Eastern Asia have not yet been discovered, but if we bear in mind that the outline of the Portuguese chart of 1502 published by Hamy (see p. 46) agrees with that of the globe, although its nomenclature is very poor; that on the Laon globe (see p. 57) the islands extending from Madagascar to Candyn and the duplicated India are identical with these features as shown on Behaim's globe, and that the map of Henricus Martellus

(p. 67) strikingly resembles the globe in the shape given to the duplicated India, we may fairly conclude that the sources drawn upon by Behaim were equally available to his predecessors not only, but also to the author of the Portuguese chart of 1502 and to Waldseemüller. In short, neither Behaim nor any of his contemporaries took the trouble to lay down Marco Polo's routes as described by himself, which would have resulted in a map very much like that compiled by myself, but were content to accept or combine the erroneous designs of incompetent older authorities.

Result with reference to the supposed extent of the habitable world.

If the reader turns back a few pages, and reads my notes on the reconstruction of Marco Polo's routes, he will find that it results in a longitudinal extent of the Old World, from Lisbon to the east coast of China, of 142 degrees. According to the Catalan map of 1375 this extent amounts to 116 degrees, according to Fra Mauro (1457) to 125, according to the Genoese map of the same date to 136 degrees, the actual extent according to modern maps being 131 degrees.

Toscanelli (1474),³ on the other hand, gives the old world a longitudinal extension of 230 degrees, thus narrowing the width of the Atlantic to 130 degrees. This encouraged Columbus to sail to the west in the confident hope of being able to reach the wealthy cities of Cipangu and Cathai. The author of the Laon globe went even further, for he reduced the width of the Atlantic to 110 degrees.

An intermediate position between these extremes is occupied by Henricus Martellus, 1489, who gives the Old World a longitudinal extent of 196 degrees.⁴

Toscanelli may be deserving of credit, for having been

¹ Placido Zurlo, 'Sulle antiche mappe idro-geografiche,' Venice, 1818. See inset on Map 3. Cardinal Placido Zurlo of the order of Camaldulense, and an esteemed writer on the history of maps, was born at Legnago 1759, died 18.

² See inset, Map 2.

³ Longitudinal Extent of the Old World. In comparing the meridional differences on non-graduated maps, the major axis of the Mediterranean has been assumed to measure 3,000 Portolano miles, equal in lat. 36 degrees to 3,690,000 m. or 41°. But if a degree of the Equator be assumed to contain 66⅔ Roman miles of 1,480 m., then 11 per cent. must be added to the figures given for Nos. 3-7.

⁴ H. Wagner, 'Die Rekonstruktion der Toscanelli-Karte' ('Nachr. der K. Ges. der Wissenschaften,' Göttingen, 1894). Paolo dal Pozzo Toscanelli, the great astronomer and physicist, was born 1397 and died in 1482 (Uzielli, 'Raccolta Colombiana,' Part V., vol. I., Rome, 1894). See also H. Vignaud, 'The letter and chart of Toscanelli' (London, 1902), and his critics, H. Wagner ('Gött. gel. Anz.' 1902), L. Gallois ('An. de Géogr.' 1902) and S. Ruge ('Zeitsch. f. Erdk.' 1902).

	1 Actual, 1907.	2 Ptolemy, 150.	3 Catalan Map, 1375.	4 Fra Mauro, 1457.	5 Genoese Map, 1457.	6 Marco Polo, plotted in 1897.	7 Henricus Martellus, 1489.	8 Laon Globe, 14.	9 Behaim, 1492.	10 Waldseemüller, 1807.
Sacrum Prom. to Strait of Gibraltar .	4	4	4	3	4	4	4	5	3	4
Gibraltar to Syria (Beiruts)	41	61	41	41	41	41	41	61	60	60
Syria to Ormuz	20	27	20	22	24	27	32	26	26	26
Ormuz to China, E. Coast	66	85	51	59	67	71	119	158	146	148
Old World (about 36° N.)	131	{ 177 or more }	116	125	136	143	196	250	234	238
East Asia to Europe	229	188	244	235	224	217	164	110	126	122
Old World, if 1° = 66⅔ miles . . . .	..	..	129	139	151	..	218	..	..	..

the first to draw a graduated map of the great Western Ocean, but when we find that he rejected Ptolemy's critique of the exaggerated extent given by Marinus of Tyre to the route followed by the caravans in their visits to Sera, and failed to identify Ptolemy's Serica with the Cathaia of Marco Polo, as had been done before him by Fra Mauro, we are not able to rank him as high as a critical cartographer as he undoubtedly ranks as an astronomer. He may have been the "initiator" of the voyage which resulted in the discovery of America, but cannot be credited with being the "hypothetical" discoverer of this new world. That honour, if honour it be, in the absence of scientific arguments is due to Crates of Mallos, who died 145 years before Christ, whose Perioeci and Antipodes are assigned vast continents in the Western Hemisphere, or to Strabo (b. 66 B.C., died 24 A.D.), whose "other habitable world" occupies the site of our North America.

Sir John Mandeville.¹

Jean de Bourgogne, dit à la barbe, a learned physician of Liège, declared on his death-bed (in 1475) that his real name was Jean de Mandeville, but that having killed a nobleman he had been obliged to flee England, his native country, and live in concealment. This pretended Englishman is the author of a book of travels which W. D. Cooley² describes as "the most unblushing volume of lies that was ever offered to the world," but which, perhaps on that very ground, became one of the most popular books of the age, for as many as sixteen editions of it, in French, German, Italian and Latin, were printed between 1480 and 1492. In the original French the author is called Mandeville, in German translations Johannes or Hans von Montevilla, in the Latin and Italian Mandavilla. Behaim calls him Johann de Mandavilla, as in Italian, although six editions of his work printed in German, at Strassburg and Augsburg, were at his command. I conclude from this that he is indebted to an Italian map and not to a perusal of his 'Travels' for the two references on the globe. The first of these (near Candyn) refers to the invisibility of the Lodestar in the Southern Hemisphere and the Antipodes, and is one of the four original statements of the learned doctor, and the second describes the dog-headed people of Nekuran (c. 18), which he has borrowed from Odoric of Portenone and enlarged upon.

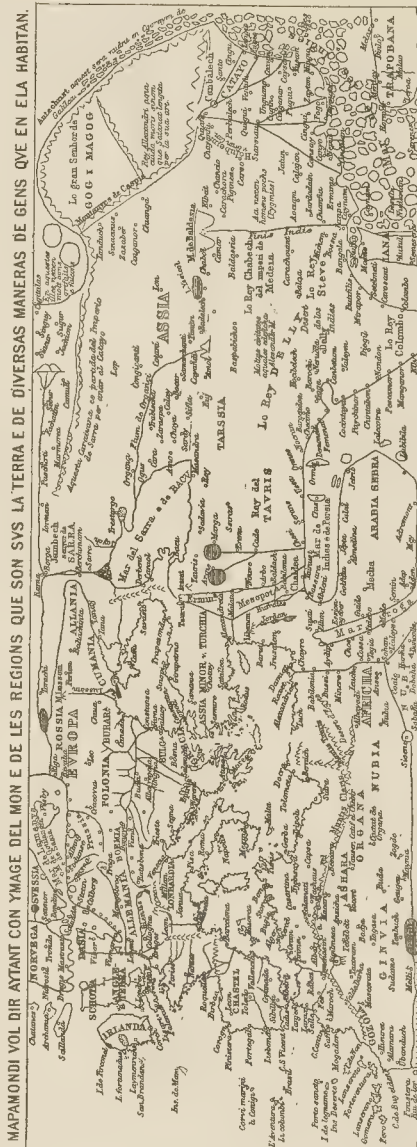
Portolano Charts.³

Portolano charts were widely distributed in Behaim's time, and the fact that the Baltic Sea (Ptolemy's Mare

¹ For an excellent paper on Mandeville and the sources of his 'Travels,' by Dr. A. Borenschen (b. 1864 at Ostrowo), see 'Zeitsch. f. Erdkunde,' XXIII., 1888, pp. 177-306.

² 'The History of Maritime and Inland Discovery,' I., p. 329 (London, 1830).

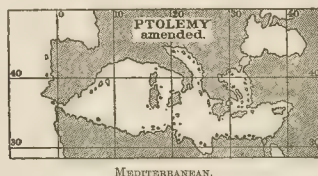
³ A description suggested by F. von Wieser, as describing "without prejudice" the charts illustrating the Italian 'Portolani' or sailing directories, previously known as Compass or Loxodromic charts.



THE CATALAN MAP OF THE WORLD, 1375.

Germanicum) appears on the globe as *Das mer von alemagna*, instead of *Das teutsche Mer*, is proof conclusive that one of these popular charts was consulted when designing the globe or preparing the map which served for its prototype. Further evidence of such use is afforded by the outline given to the British Isles, and possibly also by a few place names in Western Africa, which are Italian rather than German or Portuguese.

But whilst improving Ptolemy's northern Europe with the aid of a Portolano chart, he blindly followed the Greek cartographer in his delineation of the contours of the Mediterranean, and this notwithstanding the fact that the superiority of these Portolano charts had not only long since been recognised by all seamen who had them in daily use, but also by the compilers of a number of famous maps of the world, including the Catalan Map of 1375, which the King of Aragon presented to Charles V. of France, and whose author may have been Hasdai Cresques, a Jew of Barcelona;¹ a map of 1457, for which we are indebted to the learned Camadulite Fra Mauro, and another of the same date, elliptical in shape, whose unknown author, a Genoese, endeavoured to reconcile the conflicting views of orthodox "cosmographers" and mariners of experience. Behaim, however, erred in good company, and for years after the completion of his globe the mistaken views of Ptolemy respecting the longitudinal extent of the Mediterranean were upheld by men of such authority as Waldseemüller (1507), Schöner (1520), Gerhard Mercator (1538), and Jacobus Gastaldo (1548). It is curious that not one of these learned "cosmographers" should have undertaken to produce a revised version of Ptolemy's map by retaining the latitudes (several of which were known to have been from actual observation), whilst rejecting his erroneous estimate of 500 stadia to a degree in favour of the 700 stadia resulting from the measurement of Eratosthenes (Strabo, II., c. 5). The result of such a revision is shown on this little sketch, the scale of which is the same as that of the Maplets on p. 36.



Toscanelli.²

The chart which the learned Toscanelli sent, in 1474, to his friend Fernão Martins has been lost, whilst the only information to be found in the letter which would enable us to reconstruct it are the statements that on sailing due

west from Lisbon, Quinsay in Mangi would be reached after sailing across 26 "spaces" (of the projection) or 180 degrees of longitude, and that the distance between Antilia and Zipangu amounted to 50 degrees. The distances on Behaim's globe are approximately the same.³ S. Ruge ('Columbus,' 1890, p. 62) concludes from this that Behaim may have copied Toscanelli's chart. This is quite possible, for copies of both the chart and the letter may have been forwarded by Toscanelli to his friend Regiomontanus at Nuremberg, who had dedicated to him, in 1463, his treatise 'De quadratura circuli.'

Portuguese Sources.

When Behaim, in the spring of 1490, left Lisbon for his native Nuremberg, Bartolomeu Dias had been back from his famous voyage round the Cape for over a twelvemonth, numerous commercial and scientific expeditions had improved the rough surveys made by the first explorers along the Guinea coast, factories had been established at Arguim, S. Jorge da Mina, Benin and, far within the Sahara, at Wadan, trading expeditions had gone up the Senegal and Gambia, and relations established with Timbuktu, Melli and other states in the interior. In addition to all this, ever since the days of Prince Henry and the capture of Ceuta, in 1417, information on the interior had been collected on the spot or from natives who were brought to Lisbon to be converted to the Christian faith.⁴

There is no doubt that the early Portuguese navigators brought home excellent charts of their voyages. Columbus, who saw the charts prepared by Bartolomeu Dias, speaks of them as "depicting and describing from league to league the track followed" by the explorer. But not one of these original charts has survived, and had it not been for copies made of them by Italians and others, our knowledge of these early explorations would have been even less perfect than it actually is. These copies were made use of in the production of charts on a small scale, the place names upon which, owing either to the carelessness of the draughtsmen or their ignorance of Portuguese, are frequently mutilated to an extent rendering them quite unrecognisable. But even of maps of this imperfect kind illustrating the time of Behaim and of a date anterior to his globe, only two have reached us, namely the "Ginea Portugalexe" ascribed to Cristoforo Soligo, and a map of the world by Henricus Martellus Germanus.⁵

Behaim, of course, enjoyed many opportunities for examining the charts brought home by seamen not only, but also other curious maps, whose existence has been

³ Lisbon to Zeitun 126°, but to Quinsay 130°.

⁴ Such as Bemohi, King of the Jolof, and Caçuto of Congo.

⁵ For a notice of these maps see pp. 26, 67. The only original Portuguese chart of the fifteenth century discovered by Santarém is dated 1444, is on a small scale, extends no further than the Rio do ouro, and was not deemed worthy a place in his famous atlas. (See 'Recherches,' p. 292.)

¹ Hamy, 'Études,' p. 668.

² See p. 64 for literary references.

FRA MAURO, 1457-59.



FRA MAURO'S MAP OF THE WORLD.

HENRICUS MARTELLUS GERMANUS

1489



HENRICUS MARTELLUS GERMANUS' MAP OF THE WORLD.

recorded although the maps themselves have long since disappeared. Among maps of this kind was one in the possession of D. Fernando, the son of King Manuel, in 1528, and which had been brought to the famous monastery of Alcobaça 120 years before, i.e., in 1408; another, which D. Pedro, the brother of Prince Henry, had brought from Venice in 1428, and upon which, according to Galvão,¹ was shown the "Fronteira de Africa" not only, but also a "Cola do dragon" or dragon's tail, which has been absurdly identified with the strait discovered by Magellan; the copy of Fra Mauro's famous map, for which King Affonso, in 1459, had paid 62 ducats; the map which had been prepared under the eyes of the learned Diogo Ortiz de Vilhegas of Calzadinha for the guidance of Pero de Covilhã in the east; the map of the world, fourteen palms or about 10 feet in diameter, which H. Müntzer, in 1495, saw hanging on a wall of the royal mansion in which he resided as the guest of Joz d'Utra; and lastly, the map which Toscanelli is believed to have forwarded to King Affonso in 1474 in illustration of his plan of reaching China and Japan (Cipangu) by sailing across the Western Ocean.

In addition to maps and charts a person of Behaim's social position and connections might readily have had access to the reports of contemporary explorers. He might have learnt much from personal intercourse with seamen and merchants who had recently visited the newly-discovered regions or were interested in them. His contemporary, the printer, Valentin Ferdinand, was thus enabled not only to consult the MS. Chronicle of Azurara,² and the records of Cadamosto³ and Pedro de Cintra,⁴ but also to gather much valuable information from Portuguese travellers who had visited Guinea. Foremost among these was João Rodriguez, who resided at Arguim from 1493-5, and there collected information on the Western Sahara. To Ferdinand we owe, moreover, the preservation of the account which Diogo Gomez gave to Martin Behaim of his voyages to Guinea.⁵

The islands of the Atlantic as delineated by Behaim and Portuguese Pilots.

Having thus pointed out the materials available for the compilation of a map fairly exhibiting the results of

Portuguese discoveries up to the time of Behaim, I shall next inquire into the extent to which these results have been considered in preparing the design for the globe. The readiest and most intelligible way to do this is to place, side by side, three maps of each group of islands, drawn on the same scale, the first according to Behaim, the second according to the "Ginea Portugalexe" of 1485, above referred to, or, in the case of the Canaries, by Andrea Benincasa (1476), and the third according to modern surveys. The result is shown on Map 4. The little maps there placed side by side prove two things, *first*, the surprising accuracy of the surveys made by Portuguese pilots, *secondly*, the utter incompetency of Behaim as a cartographer. Even the Azores, where he was at home, and concerning which we might suppose him to be well informed, are no more correctly delineated than the other island groups. Fayal, where he is supposed to have observed the stars (see p. 50) is placed by him in lat. 42° N., and at a distance of 2,000 sea-miles from Lisbon, when its true latitude is 38° 40' N., and the distance less than 900 miles. The chain, which extends for 400 miles towards the W.N.W., is given an extension of 960 miles. In like manner the Canaries stretch through 850 miles instead of 280, whilst the Cape Verde Islands are placed 660 miles to the west of the Cape after which they are named, when the actual distance is only 330 miles.

A Map of Western Africa from Materials available in 1492.

In order to enable the reader to judge readily of the extent to which Behaim has availed himself of the knowledge acquired by the Portuguese concerning the interior of Africa, I have compiled, from readily available contemporary sources, a map designed to illustrate the question (Map 5). The coast-line from Lisbon as far as Montenegro, where Cão set up his second pillar in 1482, is an exact reduction of the map of "Ginea Portugalexe" referred to on p. 26. No parallels are shown on the original. I have therefore assumed Lisbon to lie in 39° N., and a degree to be equal to 75 milhas (see p. 26), and marked the degree in the margin on the right side. The coast to the south of Montenegro, as far as Dias' furthest, I might have copied from the rough map of Henricus Martellus, but I felt justified to avail myself of the chart of Juan de la Cosa. This map, although dated 1500, and consequently drawn after the return of Vasco da Gama from India, in spite of its ample but fanciful nomenclature along the east coast of Africa, does not yet embody the results of that voyage. Even the landfall of Vasco da Gama, the Bay of St. Helena, is not shown upon it.

The information on inner Guinea available for my purpose is not very ample, but its utilisation by a competent cartographer would have much improved the map of that part of Africa. Azurara had already learnt a

¹ Galvão, 'Tratado' (Lisbon, 1562), p. 67 of the Hakluyt Society's reprint, Antonio Ribeiro dos Santos, 'Memoria sobre dois antigos mappas geographicos' ('Memorias de Litteratura Portuguesa', VIII., Seg. ed. Lisbon, 1856, p. 275).

² Gomes Eannes d'Azurara, the author of the 'Chronica do descobrimento e conquista de Guiné,' only published in 1841, and of other historical works, died about 1474. He had been appointed Keeper of the R. Archives (Guarda mór da Torre do Tombo) in 1454.

³ Luigi Cã da Mosto, a Venetian merchant, was born about 1432. He is generally credited with the discovery of the Cape Verde Islands.

⁴ An account of his Guinea voyage has been preserved to us by Cã da Mosto.

⁵ See p. 2.

good deal about the inhabitants of the Western Sahara, among whom his informant, João Fernandez, had spent a couple of years (1445-7), but Cá da Mosto is the earliest traveller who furnished information of a nature sufficiently precise to be laid down upon a map. From Arguin, the Portuguese factory on the coast, he reckons six days' journey for camels to Oden (Waden), and six days more to Tegazza, whence rock salt is exported to Tombuto, a journey of forty days on horseback. From Tombuto to Melli he reckons thirty days. Melli exports gold to Cochia,¹ on the road to Cairo; to Tunes, by way of Tombuto and Tuet; and to Oran, Morocco, Fessa (Féz), and Mezza by way of Oden. It appears thus that he supposed Melli to lie to the west or south-west of Tombuto. More important is the information communicated by Diogo Gomez to Martin Behaim. According to him the road from Adem (Waden) to Tambucutu crosses the Abofar Mountains, which extend as far as Gelu (Jalo), south of Cantor on the Gambia, and separate the rivers flowing west, such as the Senega and Gambia, from those flowing to the east. He also describes a route leading from Cantor eastward through Cerekule² to Quioquia, the residence of Ber Bormelli, on a River Ennin, which exports gold to Cairo, Tunes and Féz. A lake is near it. Caravans going from Tunes to Tambucutu cross a sea of sand—Mar arenosa—during 37 days. The Moses³ of my map are inserted to the east of Tombuto, on the authority of Bemoy, King of the Jalof, who was at Lisbon in 1488; King Ogane, according to J. A. d'Aveiro (1485). This prince, the King thought, might turn out to be Prester John. The remaining names on the map are taken from A. Benincasa's map of the Mediterranean.

If now we turn to the globe we shall find that not any of the above information has been utilised by its author. There is a king Mormelli and a king Organ, but the sites assigned to them are evidently from some other source. Neither Odan (Wadan), Tombuto, nor Cantor on the Gambia, are indicated, and yet they were places of interest in the Portugal of Behaim's time. The valuable information given by Gomez respecting the divide between the rivers flowing west and east is absolutely ignored.

Miscellaneous Sources.

Foremost amongst these rank the maps in the Ulm edition of Ptolemy (1482), of which Dominus Nicolaus, a German residing in Italy, was the author.⁴ Of these

¹ The ruins of Kukiya (Cochia, Quioquia) were discovered by Lieut. Desplagne 95 miles to the south of Goa, on the right bank of the Niger (Rev. col., 1904, Sept.).

² The Serekhule, on the south bank of the Senegal above the rapids.

³ Barros, 'Da Asia', Dec. I., liv. 3, c. 7; Ruy de Pina, c. 37.

⁴ Of these maps there are three sets or versions in MS. The first set was bought by the Duke Borso d'Este, about 1464; the second set (with three modern maps) was dedicated to Pope Paul II. (1464-71); a third version with five modern maps is now the property of Prince Waldburg. These last are the maps published at Ulm in 1482.

maps that of Scandinavia is a curtailed version of one drawn in 1423 by Claudius Clavus Swartha (Niger), a Dane who lived at Rome. His map shows the actual Greenland as extending from Europe to beyond Iceland. On the map of Nicolaus published in 1482, though not in an earlier edition, Greenland is omitted.

Bartolomeo of Florence, who is said to have travelled for twenty-four years in the East (1401-1424), but whose name and reputation are otherwise unknown, is quoted at length on the spice trade.⁵

Behaim's laudable reticence as to "mirabilia mundi" has been referred to already (p. 59), but he does not disdain to introduce long accounts concerning the "Romance" of Alexander the Great, the myth of the "Three Wise Men" or kings, the legends connected with Christian Saints, such as St. Thomas, St. Matthew, St. Apollonius, and St. Brandan or St. Patrick, or the story of Prester John, all of which were popular during the Middle Ages. He quotes Genesis (instead of Kings ii. 13) in connection with Ophir, and refers to St. Jerome's introduction to the Bible.

Sources not traced.

If the reader will refer to the map illustrating the "Sources of Behaim's Globe," or to the "Nomenclature" which follows, he will find that I have been unable to trace the origin of many features and names met with. I believe that if we were in possession of the materials at Behaim's command whilst he was at Nuremberg, we should find a solution for many questions which now puzzle us, not only with reference to this globe, but also in connection with many maps of the same period. At Nuremberg he was able to associate not only with men of travel, like his patron and fellow worker George Holzschuher, but also with others who took an interest in geographical work, such as Dr. Hieronymus Muntzer or Monetarius, Dr. Hartmann Schedel, and Bernhard Walther. From these he may have learnt all about the missions upon which Frederick III. sent Nicholas Poppel to Russia, in 1486 and 1488, for Poppel came to Nuremberg on the return from his first journey, and rendered an account of his mission to the assembled "Reichstag."⁶

Of H. Schedel we know that he took an interest if not an actual share in the making of the globe. We learn this from a memorandum in Schedel's hand discovered by Dr. R. Stauber⁷ on a blank leaf of an edition of

⁵ G. Uzielli, 'Vita ei tempi di Toscanelli,' Raccolto Col., V., identifies this Bartolomeo of Florence with Nicolò di Conti, whom Enea Silvio (Pius II.) describes as a Venetian! See also W. Senaburg, 'Poggio Bracciolini und Nicolò di Conti' (Mitteln. Vienna g. Soc., 1906). Nicolò travelled 1415-40, Bartolomeo 1401-29!

⁶ Hormayr's 'Archiv für Geographie,' etc., Vienna, 1829, No. 47.

⁷ R. Stauber, 'Die Schedel'sche Bibliothek' (Freiburg, 1908), p. 60, a commentary by Dr. H. Grauert, *ib.*, p. 257. About one half of Schedel's memorandum is borrowed, without acknowledgment, from the 'Historia rerum' of Pope Pius II., especially lamentation on the want of appreciation of honest work. Does this refer to critics in Behaim's native town? (See Appendix VIII.)

'Dionysius Ofer, De Situ orbis habitabilis' (1477), where he says:—

"We produced (profecinus) this work from the most illustrious cosmographers and geographers of antiquity, such as Strabo, Pomponius Mela, Diodorus Siculus, Herodotus, Pliny Secundus, Dionysius and others, as also from moderns, including Paul of Venice (Marco Polo), Petrus de Eliaco (Pierre d'Ailly), and the very experienced men of the King of Portugal."

Further on he tells us, however, that the globe is absolutely the work of M. Behaim, and adds Ptolemy to the authorities claimed to have been consulted.

Behaim had access, likewise, to valuable collections of books and maps, most important among which was the library of the famous Johann Müller of Königsberg (Monteregio), who at the time of his death was engaged upon a revised edition of Ptolemy,¹ which he intended to illustrate with modern maps, including one of the entire world. The library had been purchased in 1476 by his friend and pupil, Bernhard Walther.² There are three sections of the globe, upon the origins of which much light might be thrown by the discovery of ancient maps formerly in the possession of John Müller. These are *first* the region between the Euphrates and Ganges; *secondly* south-eastern Asia with its many islands; *thirdly* the greater portion of inner Africa. As to the first it is remarkable that although Ptolemy's outlines of lakes and rivers have been retained, his place names have for the most part been rejected and others substituted, the source of which I have not been able to trace. Eastern Asia, with its islands, and Africa have, however, been copied from a map or maps which were also at the command of Waldseemüller. A comparison of that cartographer's map with Behaim's globe leaves no doubt as to this, unless we are prepared to assume that Waldseemüller took his information from the globe, which I have shown (p. 64) to be quite inadmissible. It was on the same map that Ritter von Harff,³ who returned to Germany in 1499 after a pilgrimage to the Holy Land, performed his fictitious journey from the east coast of Africa, across the Mountains of the Moon and down the Nile to Egypt. On Behaim's globe may be traced twenty-one names, out of about forty to be found on Waldseemüller's map of 1507, and four of them mark stages of the worthy knight's journey.

¹ A broadsheet printed at Nuremberg in 1476 enumerates the work which J. Müller proposed to carry out (Brit. Museum, IC. 7081). Joh. Werner, in 1514, published the first book of Ptolemy, which had been completed by him. Wilibald Pirckheimer embodied Müller's annotations in the Strassburg edition of 1522.

² Walther by his last will and testament enjoined his heirs to part with this valuable collection of books and MSS. only as a whole, but they discarded this injunction, and in 1522 only 145 volumes were left. They were purchased for the town library, but hardly a dozen volumes are to be found in it to-day. (H. Petz, 'Mitth. d. Ver. f. d. Gesch. d. Stadt Nürnberg,' VII., 1888, p. 217.)

³ 'Die Pilgerfahrt des Ritters Arnold von Harff in den Jahren 1496-99;' 'Nach den ältesten Handschriften,' von Dr. E. von Groote, Köln, 1860.

But long before Waldseemüller and Behaim, the same old map must have been accessible to Dom. Nicolaus Germanus, for in the map of the world in the edition of Ptolemy published in 1482 he introduces a third head stream of the Nile, which is evidently derived from it.⁴

Among maps not yet discovered are those reported to have been designed by two distinguished Italian artists, Ambrogio Lorenzetti of Siena (1290-1348) and Giovanni Bellini of Venice (1428-1516).

There is one other map to which I may refer. In the Nuremberg city library (Bibl. Solg. I., No. 34) there is a codex of 1488 containing accounts of the travels of Marco Polo, St. Brandan, Mandeville, Ulrich (Odorico) of Friaul, and Hans Schildberger, the original owner of which, Matthaüs Bratzl, steward (Rentmeister) of the Elector of Bavaria, had a "costly" map prepared to illustrate these travels. He desired that book and map should never be separated, but the map is no longer to be found.⁵ Behaim's globe contains no data which can be traced to Odorico or Schildberger.

Conclusion.

Behaim is no doubt indebted to his globe, and to the survival of that globe, for the great reputation which he enjoys among posterity. But whilst the undoubted beauties of that globe are due to the miniature painter Glockenthon, the purely geographical features do not exhibit Behaim as an expert cartographer, if judged by modern standards. He was not a careful compiler, who first of all plotted the routes of the travellers to whose accounts he had access, and then combined the results with judgment. Had he done this, the fact of India being a peninsula could not have escaped him; the west coast of Africa would have appeared as shown on Map 5. His delineation is rather "hotch-potch" made up without discrimination from maps which happened to fall in his hands. In this respect, however, he is not worse than are other cartographers of his period: Fra Mauro and Waldseemüller, Schöner and Gastaldo, and even the famous Mercator, if the latter be judged by his delineation of Eastern Asia.

But we may well ask whether greatness was not in a large measure thrust upon Behaim by injudicious panegyrists; and if, on a closer examination of his work, he does not quite come up to our expectations, they, at all events, must bear the greater part of the blame.

If, like the ghost of Hamlet's father, Behaim could have "revisited the glimpses of the moon" and wandered

⁴ See the insets on Map 2. Also my remarks on Wieser and Fischer's publication of Waldseemüller's maps, 'Athenaeum,' March 26, 1906, and 'Geogr. Zeitschrift,' XII., Heft 3, 1906. There is reason to believe that a map discovered recently by Rev. Jos. Fischer, S.J., but not yet published, is one of the "lost" maps to which I have referred ('Stimmen aus Laach,' 1906, p. 353).

⁵ The Marco Polo of this codex is the edition printed at Augsburg in 1481; the other accounts are MSS. of the fifteenth century.

through his native town when the German geographers met there in May, 1907, he may be supposed to have stared at the fine monument erected in his honour, beheld wonderingly a medal upon which his portrait was associated with that of Albert Dürer, and listened with a smile to the "Festspiel," "Im Hause Martin Behaims," written by Frau Helene von Forster.

XX. NOMENCLATURE AND COMMENTARY.

THE Gores of the Globe are lettered from A to L. (G 15) stands for Gore G lat. 15° N.; (G 15 s) for Gore G lat. 15° S. All names and legends to be found on the Globe are printed in *Italics*. Abbreviations: Jom = Jomard's facsimile; Ghil = Ghillany's facsimile; Dopp = Doppelmayr; Walds = Waldseemüller; Ptol = Ptolemy.

HOW THE TOWN COUNCIL OF NÜRNBERG ORDERED THE GLOBE TO BE MADE.

Aus fürbitt und beger der fürsichtigen erbarn und weisen als der obersten hauptleut der löblichen Reichsstat Nürnberg, die dan zu diesen zeiten Gerregiert haben, mit namen hern Gabriel Nutzal, hñ Paulus Volckamer, und hñ Nicolas Groland ist diese figur des apffels gebracketirt und gemacht worden aus kunst angebung Fleys durch den gestrengen und erbar hern Martin Behaim Ritter der sich dann in diser kunst kosmographia vil erfahren hat und bey einen drittel der welt umfahren solches alles mit fleijs ausgezogen aus den püchern ptolomei plinijs strabonis und Marko Polo und also zusam̃ gefügt alles Mer und erdreich jegliches nach seiner gestalt und form solches alles dem erbarn Georg̃ Holzschuer von Rahtswegen durch die gemelten hauptleuthe befohlen worden ist darzu er dan geholffen und gerahten hat mit möglichem fleijs. Solche kunst und apffel ist gepracketirt und gemacht worden. Nach cristi gepurt 1492 der dan durch den gedachten Herrn Martin Behaim gemainer Stadt Nürnberg zu ehren und lets hinter ihme gelassen hat Sein zu alle zeiten in gut zu gedemcken nachdem Er von hinen wieder heim vendet zu seinem Gemahl, das dann ob 700 mail von hinen ist der er hause hält und sein tag in seiner juel zu beschließen da er haheimen i/l.

By desire and request of the prudent, honourable and sapient, the chief captains of the worthy Imperial city of Nürnberg who rule at this time, and whose names are D. Gabriel Nutzal, D. Paulus Volckamer and D. Nicholas Groland, this figure of an apple has been achieved and made by the skill (art), according to the directions and by the industry of the worshipful and honourable D. Martin Behaim, Knight, who is much experienced in the art of Cosmography and has circumnavigated one third of the world. All this has been extracted with industry from the books of Ptolemy, Strabo and Marco Polo, and put together, the sea as well as the land, each according to its shape and form, as ordered to be done by the above-named captains on behalf of the City Council by the Hon. George Holzschuer, whereunto he has helped and advised with all possible industry. This (work of) art and apple has been achieved and made in the year 1492 after the birth of Christ, and has been left behind him by the said D. Martin Behaim for the honour and enjoyment of the commonalty of the city of Nürnberg in order that he may be thought kindly of for all time, when he shall have gone back to his wife, who lives 700 miles away, where he keeps house, in order to end his days in his island where is his home.

ON THE AUTHORITIES CONSULTED IN MAKING THE GLOBE.

es ist zu wissen, das in dieser gegenwärtigen figur des apffels ist ausgemessen die gantze welt nach der läng und nach der breite nach kunst geometria als uns ptolomes in seinen buch genant cosmographia ptolomeaei geschriben hat das ain thail und darnach das übrige der from ritter marco polo 1250 vñ venedig der in orient gereist hat a. 1250 aufgeschriben hat gelassen auch so hat der würdige doctor und ritter Johann de Mandavilla a. 1322 auch ein buch gelassen das nemblich die unbekante land ptolomeaei in orient lieg̃ mit samt den inseln daselbsten an tag gebracht haben von dānen uns die speereyen perlein und die edelgestein zugeführt werden aber der durchleuchtig konig don Johann von Portugal hat das übrig thail das ptolomeaei noch nit kundig gewesen ist gegen mittag lassen mit seinen schiffen besuchen año dni. 1485. dareby Ich der diesen apffel angegeben hat gewesen bin gegen untergang ist das meer oceanus auch durchfahren über die schrift ptolomeaei und die säul herculis bis in die insell das azores fajal und pico die von dem edlen und vesten ritter hern Jobsten de hürter von norckirchen mit seinen volk aus flandern das er geführt dieselbe insel bewohnt mein lieber schuer und besitzt und regirt dieselbe und der weiten orth der welt gegen mitternacht end tramontana über die schrift ptolomei eyland norwegen und reussen uns auch jetzt kundig ist und man jarlich dahin schifft daran doch niemand zweifeln soll, wiewohl die welt jimpel ist das man just überal mit schiffen fahren oder gehen mag wie hie steht. (B 1 S.)

Be it known that on this Apple (Globe) here present is laid out the whole world according to its length and breadth in accordance with the art geometry, namely, the one part as described by Ptolemy in his book called 'Cosmographia Ptolemaei,' and the remainder from what the Knight Marco Polo of Venice caused to be written down in 1250. The worthy Doctor and Knight Johann de Mandavilla likewise left a book in 1322 which brought to the light of day the countries of the East, unknown to Ptolemy, whence we receive spices, pearls and precious stones, and the Serene King John of Portugal has caused to be visited in his vessels that part to the south not yet known to Ptolemy in the year 1485, whereby I, according to whose indications this Apple has been made, was present. Towards the west the Sea Ocean has likewise been navigated further than what is described by Ptolemy and beyond the columns of Hercules as far as the islands Faial and Pico of the Azores occupied by the noble and valiant Knight Jobst de Hürter of Moerkerken, and the people of Flanders whom he conducted thither. These islands are occupied by my dear father-in-law, who owns and governs it. The far-off places towards midnight or Tramontana, beyond Ptolemy's description, such as Iceland, Norway and Russia, are likewise now known to us, and are visited annually by ships, wherefore let none doubt the simple arrangement of the world, and that every part may be reached in ships, as is here to be seen.

THE STORY OF BEHAIM'S VOYAGE.

als man seht nach cristi unfers hern gepurt 1484 Jar liefe zurüsten der durchleuchtig konig Johan II. in Portugal zwey schiff caraveli gemant geveictualhirt u. gewapnet versehen auf 3 jar dem volck und schiffen war in namens und befehl gegeben auszufahren über die säulen di hercules in africa gefohret hat immer gegen mittag und geg̃ den aufgang der sonnen so fern jñnen möglich were auch so erfahre der vorgeante konig die schiffe mit allerley wahr und kauffmanschaft die zum kauff und zu verfechen auch 18 rosse mit allen zoug köplich gerüstet wurden in den schiffen mitgeführt den mahren königen je eins zu schenken wo uns gut

In the year 1484 after the birth of Christ our Lord, the Serene King John II. of Portugal caused to be fitted out two vessels called caraveli, which were found and armed for three years. These vessels were ordered to sail past the columns which Hercules had set up in Africa, always to the south and towards sunrise, and as far as they possibly could. The above king likewise supplied these vessels with various goods and merchandize for sale and barter. The ships also carried 18 horses with costly harness, to be presented to Moorish Kings where we thought fit. We were also given various samples of

gedeuht und man gabe uns allerley
muster speccerey die zu zeigen den
mohren wobey sie verstehen mögten
was wir in ihrem land suchen wolten
und also geruht seyndt fuhren wir aus
der porthen der stadt uliſipona von
portugal und segelten zu der iſel
madera da deſe portugalzucker
wüchſt und durch die iſeln fortunatas
und die iſeln der wilden canarier
funden mohren könike denen wir
ſchenckung thaten die uns auch wider
kamen in das land in die könikeich
gambia geloff da die paradie körner
wachſen iſt von portugal 800 teutiſche
meiln darnach in konik furfuralland
iſt 1200 leuge oder meilen daſelbſt
pfeffer wüchſt den man nent portogals
pfeffer auch fern von daſen iſt ein
land da wir zinetrinden funden
wachſen als wir nun bey 2300 meilen
oder leugen geſegelt waren von portu-
gal kehrten wir wider und am 19
monath kamen wir wider zu unſern
konik. (E 39.)

spices to be shown to the Moors
(negroes) in order that they might
understand what we sought in their
country. Thus fitted out we sailed
from the port of Lisbon in Portugal
to the Island Madeira, where the
sugar of Portugal grows, and
through the Fortunate Islands and
those of the savage Canarians.
And we found Moorish Kings to
whom we gave presents, for which
they gave return presents. And
we came to the kingdoms of Gambia
and Golof, where grow the grains
of paradise, and which are distant
800 German miles from Portugal.
And subsequently we arrived in
King Furfur's country, which is
1,200 leagues or miles distant, and
where grows the pepper called
Portugal pepper. And far from
there we came to a country where
we found cinnamon growing. And
when we had sailed about 2,300
miles or leagues from Portugal we
turned back, and in the 19th month
we were once more with our king.

EQUATOR, PARALLELS AND ECLIPTIC.

The only circles drawn upon the globe are the
Equator, the two tropics, the Arctic and Antarctic circles,
and the Ecliptic.

The *circulus equinoctialis*, described as . . . *equinoctialis orient*, in the East, represents the equinoctial line or
Equator, and is divided into 360 degrees. As drawn on
the globe it is not absolutely a great circle, for it only
measures 1590 mm., whilst the globe has a circumference
of 1594 mm., corresponding to a diameter of 507 mm. or
1 foot 8 inches English. The scale is consequently
1 : 25,138,000.

The Ecliptic has the same periphery as the Equator,
but whilst its northern arc measures 782 mm. the southern
arc measures 808 mm. Along it are placed twelve disks
containing representations of the constellations of the
Zodiac. Along the northern arc the distances between
the disks are very nearly 130 mm., but along the southern
arc they vary between 129 and 138 mm.

The name of *tropicus capricorni* is inscribed upon the
original, but not that of the "tropicus cancri," which is
found, however, on the facsimiles published by Jomard
and Ghillany. Nor was I able to discover the words
"circulus arcticus" and "circulus antarcticus," although
they have found a place on the facsimiles referred to,
whilst Murr is responsible for a "polus arcticus" and a
"polus antarcticus."

THE MERIDIAN (A).

A meridian is drawn 10 mm. or 2° 30' to the west of
the sign of Cancer, or 80° to the west of Lisbon. It
measures 790 mm. on the northern, 804 mm. on the

southern hemisphere, its total length being thus 1594 mm.
Along it are placed copious notes on the length of the day
under different latitudes, the climates, the "Lords" ruling
each climate, with the symbols of the seven planets, etc.
Nearly all this is taken from the popular treatise 'Sphaera
mundi' of Sacrobosco, or John of Holy Well, first
published at Ferrara in 1472, and which up to the close
of the seventeenth century is known to have gone through
59 editions.¹

The fragments of words written from south to north
along the meridian are much corrupted. They are *dna*
. . . *sien* . . . *das* . . . *amromep* . . . *beos*, and probably
stand for *dia*, *sienes* (Syene), *alexandrios* (Alexandria),
diaromes (Rome), and *diariphios* (Riphaen).

The remainder of the legends are as follows:—

- | | | |
|----|-------------------------------|---|
| 6 | monad lang der lengft tag, | 6 months is the length of the |
| | u.s.w., 5, 4, 3, and 2 monad | longest day (in 66°N.) and so on, 5, 4, |
| | lang der lengft tag. | 3, and 2 months long the longest day. |
| 24 | stund tag iſt hier der lengft | 24 hours is here the length of the |
| | tag im ſommer. | longest day in summer. |

CIRCULUS ARCTICUS.

das 6t. clima heiſt di a miraos
iſt unter der regirung deſ mars
ſein metal iſt eiſen und ſein
hauf der ſcorpion.

ARCTIC CIRCLE.

The sixth climate is called that of
the Riphaean mountains; it is ruled
by Mars, whose metal is iron.

das viert clima heiſt man diaro-
rops und iſt unter der regirung
deſ planet Joris ſein hauf iſt
daſ zeichen deſ ochſen
ſein farb iſt weiſ ſein metal iſt
zinn omgeht er daſ
firmant.

The fourth climate is called that of
Rhodes, and it is under the rule of
the planet Jupiter, whose house is
the sign of the Bull . . . Whose
colour is white, whose metal is
tin . . . revolves round the firma-
ment.

das drit clima iſt geheifen die
alexandros das iſt unter der
regirung deſ planet mars fo
er in ſeinem hauſern iſt fo iſt er
im ſcorpion oder im wider ſein
metal iſt eiſen ſtachel ſein farb
roth In 2 Jare läuft er durch
** die 12 hauſer.*

The third climate is called that of
Alexandria; it is under the rule of
the planet Mars, whose houses are
the Scorpion and the Ram; whose
metal is iron steel and colour red.
In two years he passes through the
12 houses.

Tropicus cancri.

Tropic of Cancer.

** daſ erſt clima iſt geheife di*
meros das hat zum regent den
planet sarturnus wolchef metal
iſt play . . ne diſer planet farb
iſt ſchwarz der durchgeheth die
zwelf zeichen in vier und zwanzig
jar da iſt der längſt tag und
di längſt nacht jm jar 13 ſtund.

The first climate is called that of
Meroe; its Lord is the planet
Saturn, whose metal is lead and
whose colour is black. He passes
through the twelve signs in twenty-
four years. The longest day and
the longest night there is 13 hours.

Circulus equinoctialis.

Equinoctial Line (Equator).

das clima heiſt torida ſein tag
und nacht gleich ſein daſ gantz
jar 12 ſtund lang beſtändiglich.
** Saturnus regirt das erſt clima*
gege mittag in welchen der tag
n am lengſten mit 13 ſtund iſt Sa-
turnus heiſſer ſind die zeiche als
** der ſteinbock der waſſermann.*

This climate is called the Torrid
Zone; day and night are there always
12 hours long throughout the year.
Saturnus rules the first climate
towards the south, where the longest
day is of 13 hours. The Houses of
Saturn are the signs of the Goat and
the Waterman.

¹ The *dia* (as in *diariphios*) of Sacrobosco is Greek, and signifies
"through," whilst the *or* of the legends, whence the modern German *Uhr*,
means "hour."

Tropicus capricorni.

2. Jovis regit
 14 * mars der planet hat zu seinem
 mitat das eisen fein hauf ist der
 ♄ scorpion von er hie steht ist der
 längst tag 14 or.
 ☉ Sol regit das vierde clima fein
 reich ist fein fengst tag
 ist 14 or.
 15 ♀ Venus hat das fünft clima im
 zeichen des ochsen ist er re-
 gierend der tag ist hie am fengst
 * 15 or.
 16 * Mercurio regit das sechste clima
 ☿ zum zeichen der Jungfrau ist er
 am erste fein lengst tag ist 15 or.
 17 ☾ Luna den planet hat des siebent
 clima fein hauf ist der krebs das
 volck dieses clima ist wandelpar
 so der tag am langsten hie ist
 18 er 16 or lanck.

Tropic of Capricorn.

Jupiter rules
 The metal of Mars the planet is
 iron: his House is the Scorpion,
 and when within it the longest day
 is 14 hours.
 The Sun rules the fourth climate;
 his sign is his longest day
 is 14 hours.
 Venus rules the fifth climate in the
 sign of the Bull; the longest day
 here is 15 hours.
 Mercury rules the sixth climate; his
 first House is the sign of the Virgin;
 the longest day is 15 hours.
 The planet Moon rules the seventh
 climate; her House is the Crab;
 the people of this climate are change-
 able (inconstant, somnambulist); the
 longest day there is 16 hours long.

A glance through these legends reveals a surprising number of errors, which would hardly have been looked for from a "disciple of Regiomontanus." This is readily seen from the following tabular summary.

Climate.	Longest Day.	Latitude.	Lord or Regent.	Metal.	Colour.	Houses of the Lord.	Annual Revolutions.
I. Merces . .	18	16	♄ Saturn	Lead	Black	Goat Waterman	Years, Days. 29 167
II. Syene . .	18½	24	♃ Jupiter	Tin	Blue	Archer Fishes	11 315
III. Alexandria .	14	30	♂ Mars	Iron	Red	Scorpion Ram	1 323
IV. Rhodes . .	14½	36	☉ Sun	Gold	Yellow	Lion	1 0
V. Rome . . .	15	41	♀ Venus	Copper	Green	Balance Bull	0 225
VI. Borysthenes .	15½	45	☿ Mercury	Quick-silver	Ver- million	Virgin Twins.	0 88
VII. Rhipsaan mountains .	16	49	☾ Moon	Silver	White	Crab	0 27

It need hardly be pointed out that a day of 6 months is experienced only at the Poles and not in lat. 66°.

THE HORIZON.

The original horizon of the globe was of iron; that now encircling it is of brass, and Murr (p. 19) suggests that it is the work of Werner, the famous astronomer. It is 35 mm. broad and 10 mm. thick.

On its outer edge we read as follows:—

der ring ist genant orifont und zeigt
 das auf und absteigen der sonnen und
 der zwelf zeichen.

This Ring is called Horizon, and
 shows the rising and setting of the
 Sun, and of the twelve signs of the
 zodiac.

Anno Domini 1510 die 5 Novem-
 bris.

In the year of the Lord, 1510,
 November 5.

On the upper surface are engraved four concentric circles. The first of these is divided from E. and W. toward the N. and S. into $4 \times 90 = 360$ degrees; the second circle is divided into 2×12 parts and contains

indications of sunrise and sunset; the third and fourth give the names of the winds in Latin and German.

In the second of these rings we read *Mitternacht* (midnight) in the north, *der mittag* (midday) in the south; *der sonnen aufgang* (the sun's rise) in the east; *der sonnen untergang* (sunset) in the west; *der sonnen aufgang in den sommer* (sunrise in summer), do. in the winter, etc.

The names of the winds are as follows:—

Boreas	Norden	N.
	Nord gegen ost	N. b. E.
Aquilo	Nordnordost	N.N.E.
	Nordost gegen Norden	N.E. b. E.
Euro Boreas	Nordost	N.E.
	Nordost gegen Osten	N.E. b. E.
Wulturnus	Ostnordost	E.N.E.
	Ost gegen norden	E. b. N.
Eurus	Osten	E.
	Ost gegen Süden	E. b. S.
Subsolanus	Osteidost	E.S.E.
	Südost gegen osten	S.E. b. E.
Euro Auster	Südost	S.E.
	Südost gegen Süden	S.E. b. S.
Notus	Südsüdost	S.S.E.
	Suden g. Osten	S. b. E.
AUSTER	Süd	S.
	Suden g. Westen	S. b. W.
Africus	Südsüdwest	S.S.W.
	Südwest g. Süden	S.W. b. S.
Zephiro Auster	Südwest	S.W.
	Südwest g. West	S.W. b. W.
Favonius	Westnordwest	W.S.W.
	West g. Süd	W. b. S.
Zephrus	West	W.
	West g. Norden	W. b. N.
Circius	Westnordwest	W.N.W.
	Nordwest g. Norden	N.W. b. N.
Zephro Boreas	Nordwest	N.W.
	Nordwest g. Norden	N.W. b. N.
Corus	Nordnordwest	N.N.W.
	Nord g. west	N. b. W.

THE OCEAN.

The Ocean on Behaim's globe surrounds the continental mass of land, though covered around the North Pole with many large islands, so that in order to proceed from Iceland direct to the north coast of Asia it is necessary to pass through a narrow strait. The arctic ocean, called *das gefrorē mer septentrionel*—the frozen sea of the North—is surrounded on all sides by land. It is the "Mare concretum" of Pierre d'Ailly's 'Imago mundi,' and of the Ulm edition of Ptolemy printed in 1482.

The North Sea, the Oceanus Germanicus of Ptolemy, is described as *das engelīs mere* (D 60)—the "English Sea," for by that name it was known to the sailors of Scandinavia and of northern Germany. The Baltic, the Mare Germanicum of the learned, is called *das mer von alemāgna* (D 60), the "German Sea," which proves conclusively that Behaim in delineating that part of the world was guided by an Italian or Catalan Portolano chart.

The Southern Atlantic is called *oceanus meridionalis* (D 25 s). On the voyage thither, to the south of Cape Verde and the Cape Verde Islands, we meet with the following legend (C 4):—

es ist zu wissen das merr genant oceanus alhier zwischen den inseln cabo verde und diesem landt fast gerad under sich gegen mittag schnelligklich widerlaufft als hercules mit seinem schiffen hieher gerunnen wase and alhier den abfahl dese meers sah kert er wider und setet die feul welche durch schrift benawist, das man merck das hercules nit ferrer sey komen dann der dieses gescriben hat urt von konig von portogall ferner geschicht, Anno, 1485.

Be it known that the sea called Ocean, between the Cape Verde Islands and the mainland, runs swiftly to the south; when Hercules had got here with his ships and saw the declivity (current) of the sea he turned back, and set up a column, the inscription upon which proves that Hercules got no further. Afterwards the writer of this was sent further by the king of Portugal, in the year 1485.

The Pillars of Hercules originally stood on the island of Gades (Cadiz), outside the Straits of Gibraltar, but in proportion as geographical knowledge extended so were these columns pushed ahead.

On a Catalan map of 1450, published by Kretschmer 'Zeitsch. f. Erdk.' (1897), there are two small islands off Cape Verde described as "Illa de cades: asi posa ercules does colonos" (Cades Island where Hercules set up two columns), and on Fra Mauro's famous map of 1459 a legend to the south of Cabo rosso tells us that he had heard from many that a column stood there with an inscription stating that it was impossible to navigate beyond.

Diogo Gomez, a old mariner, well known to Behaim, to whom he presented his account 'De prima inventione Guineae,'¹ tells us that João de Castro, on his homeward voyage in 1415, had to struggle against the current which swept round Cabo de Non, upon which Hercules had set up a column with the well-known legend, "quis navigat ultra caput de Non revertetur aut non."

Gregory of Nyssa (died 395) already knew of the existence of this current, which he ascribed to the excessive evaporation caused by the great heat of the southern sun and the absence of evaporation in the cool north. Albertus Magnus (died 1280) ('Meteorologia,' II., tr. 3, c. 6) ascribed the current to the same cause, namely, a difference in the level of the ocean due to differences of evaporation, but believed the current thus produced to be steady and almost imperceptible. The actual velocity of the current to the south of Cape Non varies from $\frac{1}{2}$ to $1\frac{1}{4}$ knots an hour.

Off the southern extremity of Africa, below a huge fish, is written "oceanus maris asperi meridionalis" (F 40 s), perhaps with reference to the experience of Bartholomeu Dias when within the influence of the "brave forties."

The Indian Ocean (*Mare Indicum*, G 13, and *oceanus Indicus*, H 5) of Ptolemy, is divided into a Western Indian

Ocean, *oceanus Indicus occidentalis* (H 20 s), an Ocean of Upper India: *oceanus Indie superioris* (K 17 s) off Mangi; and an Eastern Indian Ocean, *oceanus orientalis* (M 25 s) and *oceanus orientis Indies*, or *orientalis Indiae* (M 48), to the east of the meridian of Cipangu.

Behaim's *Sinus arabicus* (F 10) corresponds to our Gulf of Aden, and this gulf as well as the *das rod mer*—the Red Sea (F 20)—is coloured red.

Ptolemy's *Sinus Persicus* is called *Dafz meer Persia* (F 27) and his *Hyrceanum mare*, *das hyrcanische mer* (F 45).

THE ISLANDS OF THE ATLANTIC.

ICELAND.

jflant, eiflandt, jflandit (D 62).

in eiflandt ist schon weifs volkh vnd findt Christen daselbst ist gewonheit das man die hundert teler verkauft vnd tre kindt geben sy hinwegk den kaufleuten vmb gots willen auf das die andern brot haben (C 76).

In Iceland are handsome white people, and they are Christians. It is the custom there to sell dogs at a high price, but to give away the children to (foreign) merchants, for the sake of God, so that those remaining may have bread.

item in jflandit findt man menschen vñ 80 jaren die nie kain brott gesen da wechft kain korn vnd an brot stat ist man dürr fisch.

Item, in Iceland are to be found men eighty years of age who have never eaten bread, for corn does not grow there, and instead of bread they eat dried fish.

in der Insel jflandit fengt men den stock fisch den man im enfer landt bringit (D 76).

In the island of Iceland they catch the cod which is brought into our country.

The story of the Icelanders selling their dogs and giving away their children is a fable invented by English and Hanseatic pirates and merchants, who kidnapped children, and even adults, and sold them into slavery. As an instance may be mentioned the misdeeds of William Byggeman, the captain of the 'Trinity,' who was prosecuted in England in 1445, for having committed this offence. (See Th. Thoroddsen, 'Geschichte der isländischen Geographie,' Leipzig, 1897, I., pp. 87–89; Baasch, 'Die Islandfahrten d. Deutschen,' in 'Forsch. zur Hamburg. Handelsgesch.,' I., 1889; Andrew Borde's 'Fyrst Boke' (1547), republished in 1870 for the English Text Society.

BRITISH ISLES.

Scotlant (D 60).

Wildt scotland (D 62) on the north coast, the "wilde Scotey" of Harding's chronicle, with a flag bearing the mysterious inscription *Ioh. M Tratz*, which Francis J. Grant, Esq., Lyon Clerk, suggests may stand for "Johnny Groat's House," whilst the kneeling figure (only shown by Ghil and Jom. and no longer traceable on the original) may refer to the Christian missionaries from Iona.

Orcanay (D 65) Orkneys. No islands visible on the original.

¹ Published by Schmeller ('Abhdln. d. phil. hist. Cl. d. Ak. der Wissenschaften,' IV., Munich, 1845) and G. Pereira ('Boletim Lisbon G. S.,' XVII., 1894).

Lincoln (D 61) on mainland, which is omitted by Ghil and for which Jom substitutes Saba! We should have expected to find Catenes (Caithness) in that position.

Edmundeburg (D 60), Edinburgh.

Tillf (D 59), the insula de til or tilf of Dulcert (1339), Andrea Benincasa (1476) and of others, off the Tay. This imaginary island is believed to be Thule. For a discussion of the question see Gough's edition of Camden's 'Britannia,' III., 126, 726.

The Western Isles of Hebrides (D 60) are shown, but the names attached to them, *irgan*, *bea*, *dfeids* (Ghil and Jom call them argat, tia or lia, and led), are evidently much corrupted. Among the islands named by Dulcert (1339) and A. Benincasa (1476) are Argate, bra and ledros, which Hamy ('Études,' p. 436) ventures to identify with Egach, Bara and Torosay.

Engelant (D 55) with the Royal Standard (the leopards of England quartered with the lilies of France).

Jork (D 58), given by Jom only, York.

huntingdon (D 57).

glocester (D 55).

bristol (D 54).

Reymor (D 52), given by Jom only. It is A. Benincasa's Premua or Plymouth.

forlinge (D 56), the Scilly Islands.

portsmouth (D 53).

lambeth (D 54).

london (D 55).

cambridge (D 57).

Illa da man (D 56), the island Man.

Jrlant (D 55), Ireland with the Royal Standard, the Irish Harp quartered with the lilies of France.

wales (D 58), erroneously placed in Ireland, but may be intended for Galveu (Galway), with which Portugal had frequent intercourse (Barros, 'Asia,' I., I., 126).

castell (D 52), the "VII Castelle" of Pareto (1445), now Castle rocks in Castle Haven, Co. Cork.

wexford (D 53).

St. Patrici fegfeuer (D 58), St. Patrick's Purgatory, a cavern filled with Devils, in Lough Derg, Donegal. For the legend connected with it see Th. Wright, 'St. Patrick's Purgatory,' London, 1884; a flag charged with a black man, holding in one hand a burning torch, in the other a stick, rises from this place of pilgrimage, still visited by humble penitents. Sir A. E. Vicars, Ulster King of Arms, is "completely at a loss" as to the origin or meaning of this flag.

INSULA DE BRAZIL.

The imaginary *Insula de prazil* (D 52), to the west of Ireland, appears for the first time on Dulcert's chart (1339). Subsequently, in the Medicen Portolano Chart of 1351, it figures as one of the Azores, usually identified with

Terçeira, a cape of which still bears the name of Morro do Brazil. Later charts, like that of Pizzigani (1367), contained three islands of the name, the one furthest north lying to the west of Ireland. It is this northern island which retained its place on the maps till late in the sixteenth century, and, together with the islands of St. Brandan and of the Septe citez it still appears on Mercator's chart of the world in 1587. It is this northern island which was searched for in vain between 1480 and 1499, and figures on Behaim's globe (see Hardiman, 'O'Brazil, or the enchanted island,' London, 1675); O'Flaherty, 'a chorographic description of the west of Connaught, 1684,' published by the Irish Archaeol. Soc. in 1846).

THE AZORES.

Insula dos azores. . . catharides (C 40).

Insula de Săcta maria (C 37), ilha de S. Maria.

Insula de fant michel (C 40). Ilha de S. Miguel, with the Portuguese flag. We are told nothing about the "burning mountain" and the great earthquake which happened in 1444.

Insula de Jefu cristo (C 43), ilha de Jesus Christo, now Terçeira.

Insula de pico (B 40), ilha do Pico.

neu flandern, oder Insula de faial (B 42), New Flanders or Ilha do Fayal. Two flags fly above the islands from the same flagstaff, the upper one with the arms of Nürnberg, the lower with those of Behaim. Two more flags are merely shown in outline and may have been intended for the arms of Portugal and Hurter. These skeleton flags are omitted on the Paris facsimile.

Insule de flores (C 44), ilha das Flores.

A sea-horse and four vessels sailing to the west are shown to the south of Flores.

The following legend to the north-east of the Azores has been added after Behaim's death:—

Martinus behaimus verschied zu lisibona anno domini 1506 im 29 juli (C 45).

Martin Behaim died at Lisbon in the year of the Lord 1506 on the 29th July.

nach crifti unfers lieben hern gepurt 1431 jar also regiert in portugal infante don pedro wurden nach notwurft zugericht zway schiff auf 2 Jar gespeiset von den hochgebornen Infanten don heinrichen des koniks aufs portogalli bruder zu erfahen was do wer hinder sanct Jacob synis terre weliche schiff also gerüst fogellen alsoeg nach dem untergang der sonnen bey 500 teusche meilen zuletzt wurden sy aims tags ansichtig dñs 10 inseln und aufs landt tretendt funden nichts dann wildnuys und vögel die waren so zam dafs sy vor niemandt flohen aber von leuten oder thieren mit vier füssen war von wege der wildnuess kains darckhunen zu wohnen um deßwillen die vögel nit scheueh

1431 years after the birth of our dear Lord, when there reigned in Portugal the Infante Don Pedro, the infant Don Henry, the King of Portugal's brother, had fitted out two vessels and found with all that was needed for two years, in order to find out what was beyond the St. James' Cape of Finisterra. The ships thus provided sailed continuously to the westward for 500 German miles, and in the end they sighted these ten islands. On landing they found nothing but a wilderness and birds, which were so tame that they fled no one. But of men or of four-footed animals none had come to live there because of the wilderness, and this accounts

waren also wurden sy geheiffen in-
fulen dos azores das ist auf teutsch so
vil als der habichen inseln und umb
welchs willen der künig von portugal
das ander jar schickt 16 schiff mit
allerley zamē thierē und ließe auf
jede insel fein tail thun umb darzu
multiplicieren (ABC 65).

die obgeschriebene inseln wurde bewohnt
anno 1466 wan der konig vō portugal
dise inseln vō vleissiger bydte wegen si
geschenckt hei der herzezin vō bur-
gund seiner schwester mit namen
frauen jßabella und waren in flandern
dysmal groſe krieg und tœrung, und
schickte die vorgenant herzezin vil
volks man und frauē allerley hand-
werk mit sambt priesteren und was zum
gottesdienst gehört etwen vil schiff mit
hausrath und was zu dem veldbau
gehört zu pauen aus flandern in
die insel liſe jedem in die zwai jar
geben waſe sy nottûrffig sein umb zu
ewigen zeiten in allen messen jr zu
gedenken jegliche person mit einim
ave maria welcher personē bei 2,000
warē und mit denen die feiter jârlich
darkumen findt und feiter darine
gewachsen di findt vil tausent worden
anno 1493 do wōnt in vil tausent per-
sone noch da von teutsch und flaming
angeseffen welche unter dem edlen und
gestrengen ritter hern jobsten vō hûrtter
hern zu mörkirchen aus flandern meînē
lieben hern schwæher dem dîse insel von
der vorgenanten herzezin von burgundt
jme und seinē nachkhumen gegeben ist
in welchen inseln der portugalschel
zucker wechſt und die frucht nider
im jar wan daselbst nîmermehr winter
ist und alle leibe nahrung vast wolfeil
ist darumb kumen noch jârlich vil
volcks da umb jr narung da zu
suchen (B 20).

for the birds not having been shy.
On this ground the islands were
called dos azores, that is Hawk
islands, and in the year after the
King of Portugal sent 16 ships with
various tame animals, part of whom
were put on each island there to
multiply.

The above islands were first settled
in the year 1466, the King of
Portugal having presented them to
his sister Donna Isabella, Duchess
of Burgundy, who had urgently
begged for them. There was at the
time a great war and dearth in
Flanders. The Duchess then des-
patched several vessels with men
and women, mechanics and priests,
together with utensils, for divine
service, also domestic furniture and
what is needed for agriculture.
And each person was supplied with
what was needed during two years
on condition of remembering her
for all time in all masses, each
person saying one Ave Maria. Of
these persons there were 2,000, and
adding those who have come since
that time every year, and the
annual increase of population, there
are now many thousands. In the
year 1490 many thousand persons
had settled there, Germans and
Flemings, under the noble and
worshipful Sir Jobst von Hürter,
lord of Moerkerken in Flanders, my
dear father-in-law, to whom and his
descendants the said duchess gave
this island. In these islands grows
the sugar of Portugal, and the fruits
ripen twice annually, for it is never
winter there, and food of all kinds
is very cheap, on account of which
many people still go there every
year in search of a living.

Behaim's bald and unsatisfactory account of the Azores
is all the more surprising if it be borne in mind that he
resided for years upon one of the islands, and enjoyed
exceptional facilities for gaining a knowledge of their
geography and the history of the colonization. The short-
comings of Behaim as a cartographer have already been
pointed out by me (see pp. 58, 68).

Behaim's statement that the "sugar of Portugal"
grows in the Azores is not borne out by other authorities,
for Madeira was well known as the great sugar island of
the Lusitanian Kingdom which yielded the King a splendid
revenue. Val. Ferdinand in 1507 mentions woad, orseille
(brazil) and wheat as the principal exports, and says
nothing about sugar.

MADEIRA.

Insula de maderā (C 33), with the flag of Portugal;
south of it a sea-horse.

CANARY ISLANDS.

canarie (C 28), Ilhas Canarias, with the banner of Leon
and Castile.

lāzaron (C 28), Lanzarote, named after Lanzarote
Marocello, a Genoese.

forteventura (C 26).

gran canaria (C 26).

teneriffa (C 25), otherwise called Insula del Inferno,
because of its volcano, but already known as "Tenerifa"
to the Spanish Friar (1345) and to Azurara.

palma (C 27).

offera (C 25), Hiero, vulgo Ferro.

gomera (C 26).

CAPE VERDE ISLANDS.

cabo verde . . . fortunata (C 20).

insule de cabo verde oder insula Cape Verde Islands or Fortunatae
fortunata sind gefund und bewont vō Insulae, discovered and settled by
portugaleſen anno 1472. the Portuguese in 1472.

Insula fall (C 11), Ilha do Sal (1462), originally (1460)
called ilha de lana ("wool island").

bona (C 14). The Ilha da boavista of Cadamosto,
called Christovão in 1460 and 1462.

Insula de majo (C 16), Ilha do Maio, called Ilha das
majaes, "Daisy-island," in 1460.

It is obvious that the position of these three islands
should be reversed.

Insula de Sctō Jacomo (C 13), Ilha de São Thiago.

sant philippo (C 13), S. Felipe, soon after its
discovery known as Ilha do Fogo, because of its volcano.

Insula brava (C 12), Savage Island.

San nicolo (C 15), Ilha de S. Nicolau.

San vicenti (C 15), Ilha de S. Vincente.

Sata lucia (C 16), Ilha de S. Luzia.

Sāt antonio (C 17), I. de S. Antão.

A merman and a mermaid are sporting to the south;
a Portuguese standard flies above the islands.

In identifying the Cape Verdes with Ptolemy's
Fortunatae Behaim errs in good company, for Barros
(*'Asia,'* Dec. I., liv. II., c. 1) committed the same mistake.

The legend looks like an abridgment of a similar
legend on an Italian chart, for on Waldseemüller's map of
the world (1517), which has certainly borrowed nothing
from Behaim's globe, we read: "Insule Portugalensium
invente tempore henrici Infantis anno 1472." The date is
obviously wrong, for Prince Henry the Navigator died on
November 13, 1460. At that time the five eastern islands
had most certainly been discovered. The official discoverer
was Antonio de Nolli, with whom may have been
associated Usodimare and Cadamosto (as supercargo on
one of the vessels), and perhaps also Diogo Gomez. This
discovery happened in 1456. The seven western islands,
to judge by the names they bear, were discovered between

December 6, 1461, and January 22, 1462, by Diogo Affonso, a gentleman in the household of D. Fernando, the King's brother, who is credited by Barros with the discovery of Cabo branco and mentioned by Azurara (cc. 32-36). They were granted to D. Fernando by a decree of September 12, 1462.¹

ANTILIA.

Insula antilia—septe ritade (B 22). *Antilia—sete cidades.*

Murr already read "ritade" and translated "septem reticulac."

*als man zelt nach cristi gepurt 734
for als ganz hispania von dē heiden
auf affrica gewonnen wurd do wurd
benant di obgeschriben Insula antilia
genant Septe ritade von einem erz-
bischoff von porto portigal mit sechs
andern bisclawen und andern cristen
man end frawen dē zu schiff von
hispanie dar geflohen kōmen mit
irem vieh hab und gut anno 1414
ist ein schiff aus hispania vngesert
darbei gewest am neyften.*

In the year 734 of Christ, when the whole of Spain had been won by the heathen (Moors) of Africa, the above island Antilia, called Septe citade (Seven cities), was inhabited by an archbishop from Porto in Portugal, with six other bishops, and other Christians, men and women, who had fled thither from Spain, by ship, together with their cattle, belongings and goods. 1414 a ship from Spain got highest it without being endangered.

An imaginary island of Antilia has found a place upon the charts since the fourteenth century and was at an early date identified by the Portuguese with the equally imaginary Ilha de sete cidades, the island of the seven cities,² whither the Archbishop of Oporto with his six bishops is imagined to have fled after the final defeat of King Roderick of the Visigoths on the Guadalete (711) and the capture of Merida (712) by the Arabs.

Galvão³ reports that in 1447 a Portuguese vessel, driven westward by a storm, actually arrived at the island, the inhabitants of which still spoke the Portuguese tongue; other voyages to this island in the time of Prince Henry are referred to in the 'Historie' of Fernand Colombo. These voyages, however, are purely imaginary, or, at all events, led to no actual discoveries. It is certain, however, that Fernão Telles, in 1475, and Fernão Dulmo, in 1486, were authorized to sail in search of this imaginary island.⁴

Antilia on the ancient maps is a huge island, quadrangular in shape, resembling in all respects the Cipangu of Behaim's globe.⁵ The "Antilia" of the globe, on the other hand, includes two islands, which seem to represent the "ciertas islas" depicted on Columbus's chart,

but vainly searched for on September 25, whilst Cuba, on October 28, is identified with Zipangu.⁶

ST. BRANDAN'S ISLAND.

Insula de fant brandan (A 7), St. Brandan's Island.

*nach cristi gepurt 565 kam S. brandan
mit seinen schiff auf dē Insul der
dofelst vil wunder besah und über
fiben Jar darnoch wider in sein land
zēg.*

In the year 565 after Christ, St. Brandon in his ship came to this island where he witnessed many marvels, and seven years afterwards he returned to his country.

The legend of the Irish abbot St. Brandan, who, after a seven years' peregrination over a sea of darkness, penetrated to an Island of Saints—a terra repromissionis sanctorum—was very popular during the Middle Ages. A German version of the legend—'Sant Brandan's buch'—was printed by A. Sorg at Augsburg in 1476, and St. Brandan's Island retained a place upon the maps, notwithstanding Vincent of Beauvais' disbelief in the legend, until the days of Ortelius (1570) and Mercator; and as recently as 1721 the Governor of the Canaries sent out a vessel to search for this imaginary island. St. Brandan's Island is generally associated with the Canaries, as on the Hereford map (1280), but Dulcert's "Insulla Scti Brandani sive puellarum" (1839) lies further north, whilst Pizzigani's "San Brandany y ysole Pouzele" lie far to the west (1367).⁷

CONTINENTAL EUROPE.

SCANDINAVIA.

Scandinavia is almost wholly copied from a map in the Ulm edition of Ptolemy published in 1482.⁸ The author of the globe was well aware that the three northern kingdoms, since the Union of Calmar (1397), were ruled by the King of Denmark, for the standard of that kingdom flies at the mouth of the Elbe, at the westernmost point of Norway and on Iceland.

tenmark (E 59), Denmark and *coppenhagen*, with a miniature of the king.

nordwege (E 63), Norway.

bergē (E 64), Bergen, the well-known trading town.

thyle (E 63), an island on the coast of Norway (Telemarken) is undoubtedly meant to represent the Thule of Pytheas of Massilia, although that island is more correctly identified with Shetland, known to sailors (according to Caspar Peucer, b. 1525, d. 1602) as Thillensell. See Müllenhoff, 'Deutsche Altertumskunde,' I.

¹ 'Alguns Documentos,' pp. 22, 27, 31, 90. The latest work dealing with the disputed history of the Cape Verde Islands, by Senna Barcellus, was published at Lisbon in 1899-1900. Prof. H. Yule Oldham, in his proposed work on Cadamosto, will no doubt deal fully with this question.

² For instance, on the chart of Gratiotus Benincasa, in 1483. See also Las Casas, 'Historia,' liv. I, c. 13.

³ 'The Discovery of the World,' London, 1862, p. 72.

⁴ 'Alguns Documentos,' pp. 41, 58, 62.

⁵ See inset on Map 2, giving Antilia according to Gratiotus Benincasa (1482) and Cipangu according to Behaim.

⁶ See Markham's translation, London, 1893, pp. 28-56.

⁷ On St. Brandan see De Goeje, 'La légende de Saint Brandan,' Leiden, 1890; A. Jubinal, 'La légende latine de S. Brandan,' Paris, 1836; Kretschmer, 'Die Entdeckung Amerikas,' Berlin, 1892, p. 186.

⁸ On the origins of this map see Nordenskiöld's Facsimile Atlas, pp. 49, 54, 66.

ventland (E 65), venthelandt of the Ulm Ptolemy, perhaps "Witland (or Wintland) gens ydolatra" of Ranulf Higden's 'Polychronicon.'¹

groenlād (E 70), *grōnē* . . . Greenland, evidently the Greenland referred to in a Bull of Gregory IV. in 832, which G. Storm identifies with Angermanland.

wildt Lapplant (E 68 & 77), Savage Lapland.

. . . *slant* (F 76).

venmarck (F 73), Finmark.

Sweden, fuede (E 62), Sweden.

ſackholm, Stockholm.

ubfa (Jom only), Upsala?

vermelant (E 65), Wermland.

exosta (E 63), arosia of the Ulm Ptolemy.

olant (E 64), corrupt spelling for Finlant (Finland) and not Aland or Oeland.

gottland (E 67), gottia of the Ulm Ptolemy, now Gotthland.

gotlant (E 60), the island still known by that name.

NORTH-EASTERN EUROPE.

polen (E 53), Poland.

lemberg (E 52), actual lat. 42° 48' N.

craccoru (E 50), actual lat. 50° 4' N.

bromberg (E 51).

preiſſe (E 52), *Prufe* (E 54), Prussia, with the coat of arms of the Teutonic Knights.

tomic (E 53), perhaps torun, Thorn.

liſtant (E 57), Livonia.

liwen (F 60), Livs.

reuſſen (E 53), Russia.

dī moſcha (F 57), Moscow, actual lat. 55° 45' N.

grof nogart (F 60), *gehert den herzog von moscha* (belongs to the Duke of Moscow). This is Novgorod, the famous emporium, hard pressed by Ivan the Great since 1478, and utterly destroyed by Ivan the Terrible 1579. Ghillany writes Negart, Jomard Neugart, both give the legend, which is still visible on the original, and a blank shield.

klein nogart (F 61), Little Novgorod, now Ivan-gorod, opposite Narwa on the Gulf of Finland.

ſmolenska (E 52), Smolensk on the Dniepr.

dōne Fl. (F 53), the river Don, already known by that name to Friar John of Pian de Carpine, 1245. The river is named only on Jomard's facsimile.

Julien Cāſar's (F 55), Caesar's arae in European Sarmatia (Ptolemy, III., 5).

alena (F 55), Jom allac, not traceable on the original; perhaps the Alauni of Ptolemy, III., 5.

Sarmat Aſie (F 55), Sarmatia asiatica (Ptol. V., c. 87), but actually in Europe.

¹ Ranulf Higden (Hyggeden) was a learned Benedictine in the Abbey of St. Werburgh, in the County of Chester, where he died, 1363 (see K. Miller, 'Die ältesten Weltkarten,' II., III., 1895).

HUNGARY AND THE LOWER DANUBE.

Ungern (E 46), Hungary.

preſburg (E 49).

ſtuhlweiſenburg.

ſibeburgē (E 48), Transylvania.

hermanſtadt (E 47).

zeng (E 45), on the Adriatic.

croat (E 46), Croatia.

walachei (E 46), Walachia.

buchareſt (E 46).

beſſarabia (E 48).

moldau (E 48), Moldavia, which during the reign of Stephen IV. (1456-64) included also Bukowina, Bessarabia, and part of Walachia, and was strong enough to inflict defeats upon Hungarians, Turks and Poles.

GERMANY.

The Rhine and other rivers are roughly indicated, but the only river named is the *donau* (Danube, E 47), to the north of which the German Emperor is seated on his throne. There is no Imperial standard, the only flags being those of Flanders and of Denmark (at the mouth of the Elbe). There are six coats of arms, namely those of Westphalia, Saxony, Bavaria, of the Teutonic knights, Nuremberg and Mülhausen in the Elsass (a wheel argent in a red field). The town of Mülhausen is not named, and the coat of Bavaria occupies the site of Nuremberg (called *Behaim* on the globe), a forecast only realised in 1806, when that Franconian city was assigned to Bavaria.

A man, seated on a chair, may represent a *Stuhlherr* or Judge, of the Vehm, which from Westphalia had spread over all Germany.

fland (D 54), Flanders, along the flagstaff.

riffel (D 53), the Flemish name for Lille.

holant (D 56), *hollat* (E 54), Holland.

friſlant (E 55), Friesland.

holſtein (E 56).

mecklenburg (E 54).

brandenburg (E 53).

pomer (E 54), Pomerania.

ſchleſia (E 54), Silesia.

lothring (D 52), and *nancy* (D 52).

franche Comte (D 51), and *beſancon* (D 49).

weſtphale (E 53).

ſächſe (E 51), and *dreſte* (E 52), Saxony and Dresden.

ſtraſburg (D 50), and *baſel* (D 48).

beſaim (E 49), occupies the site of Nuremberg.

hof (E 50).

beirn (E 49), Bavaria.

aufſburg (E 48).

münchen (E 47).

behmē (E 46), Böhmen, Bohemia.

prag (E 51).

mehre (E 50), Mähren, Moravia.

olmitz (E 50), and *brünn* (E 50).

oesterreich (E 49), Austria.

wien (E 48), Vienna.

linz (E 47).

Inspruck (E 46).

trieft (E 45).

Zwiltz (D 48), *Schwitz* (E 49), Schwitz, Switzerland.

gothart (D 46), the Pass of St. Gotthard.

FRANCE.

frankreich (D 50), France.

paris (D 50), with coat of arms of the city. Actual lat. 48° 50' N.

picardia (D 53), Picardy.

amiens (D 52).

artois (D 51).

calis (D 52), Calais.

Havre de grace is shown on the Paris facsimile, although the town was only founded in 1517. No name is now to be traced on the original, but perhaps Roan (Rouen) stood there once.

caen (D 51).

britannia (D 49), *bretagna* (D 50), Brittany.

breft (D 50).

rēnes (D 49).

nantès (D 48).

Off Britania lies the island of *Jerfei* (D 49), one of the Channel Islands.

poitou (D 48).

angerf (D 47).

saintange (D 46).

bordeau (D 46), actual lat. 44° 50' N.

limoges (D 47).

toloſa (D 45), Toulouse.

montpellier (D 44).

poitiers (D 49).

orleanſ (D 49).

clermont (D 47).

lyon (D 47).

dauphine (D 46), Dauphiné.

delphina (D 43). Delphinatus is the Latin name for the Dauphiné, but the name on the globe as well as the flag, point to Marseilles, although that ancient port never formed part of the Dauphiné. The flag seems to be a combination of the flags of Provence, Toulon and Marseille.

PORTUGAL.

konikr. portogallia (D 42), Kingdom of Portugal, with Royal Standard.

lisbon (D 40), actual lat. 38° 42' N.

setubal (D 40).

algarve (D 30).

alentejo (D 41).

minho (D 42).

CASTILE AND ARAGON (SPAIN).

hispania (D 43 and 45), with a Royal Standard of Castile and Leon.

Castilla (D 41), *caſtello* (D 38), Castile.

soria (D 43).

salamanca (D 41).

galicia (D 45), with the Royal Standard of Leon and Castile.

Santiago (D 43), the famous place of pilgrimage, Santiago de Compostella, with an image of the saint off the coast.

asturia (D 44).

viſcaya (D 44), Biscay.

navarra (D 44).

murzia (D 40).

andaluſia (D 40).

sevilla (D 39).

cales, cadiz (D 38), Cales, evidently a corruption of Gades, the ancient name of this famous town. The Royal Standard of Leon and Castile rises at the entrance to the Strait, that of Portugal facing it on the African shore.

granada, granata (D 38), with the old Moorish flag of Granada (a pomegranate in red). Granada was captured from the Moors 1492.

arago (D 41 and 43), with the red and gold flag of Aragon.

catalonia (D 43).

valencia (D 41).

ibiza (D 39), *maiorea* and *minorca* (D 40), the Balearic Islands.

ITALY.

Italia (E 43), Italy.

rom (E 41), with two saints (Peter and Paul) kneeling off the coast.

neapel (E 41), Naples.

calabria (E 39).

taranto (E 40).

chiela (E 42), Chieti? (between Bari and Brindisi).

loreto (E 43), the famous place of pilgrimage.

florenſ (E 43), Florence.

venedig (E 45), with the winged lion of St. Mark of Venice.

lombardj, Lombardia (D 43).

mailant (E 44), Milan.

genua (E 43), Genoa.

nizza (D 43), Nice.

pimond (D 44), Piemont.

saffoia (D 45), Savoy.

corfica (D 40).

sardinia (D 37), with the flag of Genoa.

Silcija, ſicilia (E 36 and 38), with the Royal Flag of Sicily.

maſſina (E 39), Messina.

ſiracuſa (E 37), Syracuse.

Malta has been forgotten, as on the maps of Giovanni Leardo (Santarem, Essai, III., 440) and of Waldseemüller, 1507.

THE BALKAN PENINSULA.

pola (E 45).

Zara (E 44).

ragusa (E 43).

rifana (E 43), the modern Rissano, on the Gulf of Cattaro.

albania (E 44).

scutaria (E 42).

palogea (E 41), on Jomard's facsimile only. It may be identical with A. Benincasa's Palormi, the modern Palermo.

Johania (E 39), Yanina.

The island of *corfu* (E 40) is shown on the original, but it is named only by Jom and Ghil.

morea (E 35).

corint (E 36).

livadia (E 37).

lepanto (E 38).

macedonia (E 40), with coat of arms (three crowns in red).

philippi, placed beneath, is meant for a town of that name founded by Philip II., which flourished until destroyed by the Turks. Its ruins are still known as Filibe.

kriehenlant (E 42), Greece, in the place of Thrace or Rum-ili, the country of the Byzantine Greeks.

constantinopoli (E 42), Constantinople. Above it rise two flags, the one red with five stars, the other green with a crescent and three stars. Constantinople was captured by the Turks in 1453.

adrianopla (E 44).

suffey (E 43), Sofia, the capital of Bulgaria.

candia (E 35), with the flag of Genoa, although the island had been bought by the Venetians in 1204, and was held by them until 1669, when the capital, after a memorable siege, surrendered to the Turks.

LITTLE TARTARY.

Long before the close of the fifteenth century Ivan III. of Muscovy had thrown off the yoke of the Tartars.

As early as 1473 he had entered into an alliance, defensive and offensive, with Mengli Girei, the Khan of the Crimean Tartars (1469-1515). This alliance was mainly directed against the predatory Golden Horde, and it was not broken off when Kaffa fell into the hands of the Turks, and Mengli Girei became a feudatory of the Ottoman Empire.

Sarai, the flourishing capital of the Golden Horde, the Zavolzhskiy of the Russians (i.e., those beyond the Volga), was plundered by the Russians in 1480, and totally destroyed, soon after, by Ibak or Ivak Khan of the Sheiban Horde of Tyumen or Sibir. In 1481 this same

Ivak inflicted a disastrous defeat upon the Golden Horde, in the course of which Kuchuk Mohamed or Ahmed lost his life. The sons of Ahmed—Seyed Ahmed, Murtaza and Sheikh Ahmed—then assumed the rule over three sections of the tribe, whilst a cousin—Abdul Kerim—established himself at Citracen (Astrakhan). The Nogai, a section of whom was established to the west of the Dniepr whilst the bulk held the region of the rivers Yaik (Ural) and Yemba (Emba) far to the east, still owned allegiance to the chiefs of Kipchak.

Kazan was taken in 1487 by the Russians, who carried off Ali or Ilham Khan a prisoner, and installed in his stead Mohamed Amin, a stepson of Mengli Girei, who was their protégé.

Lastly there was the Sheiban Horde, of Tyumen, Sibir or Turan, under Ivak, in close alliance with Russia.

On the history of these Tartar tribes see Karamzin, 'Geschichte d. Russischen Reiches,' Riga, 1820-23; Hammer-Purgstall, 'Gesch. d. Goldenen Horde,' Pest, 1840; Howorth, 'History of the Mongols,' London, II., 1880.

difer kaifer vō tartaria heißt macoc This Emperor of Tartary is called
(Jom and Ghil: *mawc*) (F 53). Macoc (Mawe).

This legend evidently refers to the Crimean Tartars, but no Macoc or Mawe is mentioned among their Khans. It may, however, refer to Ivak, the Khan of the Sherban Horde of Tyumen, who defeated Kuchuk Mohammed Khan of the Golden Horde or Kipchak in 1480 (Hammer-Purgstall, p. 401).

kaffa (F 48), with a Turkish flag, the famous emporium founded by the Venetians on the ruins of Theodosia (1262); vainly besieged by Berke or Janibeg Khan, the Jambec of the Catalan Map (1844), but captured by the Osmanli (1479).

difer kaifer vō tartaria heißt sobolijki der ist fast mächtig und krigt der herzog von der mofcha (F 50). This Emperor of Tartary is called Sobolijki; he is very powerful and makes war upon the Duke of Muscovy.

This legend refers to the Golden Horde, which up to 1480 frequently invaded Muscovy and enforced the payment of tribute. Instead of Sobolijki should be read Zavolzhskiy, the "Transvolgan."

sara (F 48), Sarai, the famous capital of the Golden Horde, founded by Batu Khan on the Lower Volga, about 1250, but destroyed in 1480. Its extensive ruins still exist near the village Selitronoie. Another Sarai—Sarai al Jedid, the new Sarai—stood higher up on the Volga, near Tsaref, and is supposed to have been founded by Berke or Janibeg (1342-57). See F. M. Schmidt, 'Zeitschrift f. Erdkunde,' XX., 1885, pp. 233-48.

Jom and Ghil omit Sarai, and inscribe Senta in its place.

d. kaiser after | schuckt | genat, in der | gat | stat ? | sa | sara in | tala | ria (G 53). This Emperor called after schuckt in the town of Zara (Sarai) in Tartary.

According to Jomard this legend reads as follows :—

D. Kaiser | oger sohmert | genannt | in vergot | Zardius | tartaria.

Ghillany has :—

Kaiser | ufer | schuert | in ver | gat zaraia | in tartar | ia.

Room is left for a miniature. Zara is evidently Sarai (see above), destroyed in 1480. As to the name of the "Emperor" I can offer no suggestion.

ASIA.

ASIA MINOR.

Unless where stated otherwise the following names have been taken, directly or indirectly, from Ptolemy's geography.

Bithynia (Ptolemy V 1).

nicomedia (F 42), mod. Ismid.

heraclea (F 42), Heraclea Pontica, mod. Eregli.

Asia (E 41), (Ptolemy V 2).

lopardita (E 41), with a Turkish flag (crescent and star in red).

pergama (E 40), Pergamum, mod. Bergama.

cyrinae (E 39), Myrina.

Smyrna (E 38), mod. Ismir.

S. Blacg (E 38).

cnidius (E 36).

sardus (E 40), Sardes.

rodes (E 35); Rhodes is without a flag, although held by the Knights of St. John up to 1522.

licia (F 37), Lycia (Ptolemy V 3).

pullara (E 36), Patara.

abala (F 39)?

Galatia (Ptolemy V 4).

amirfus (F 43), Amisus, mod. Samson.

ancyra (F 39).

angora (F 39), the modern name of Ancyra.

Pamphylia (Ptolemy V 5).

side (F 37), Side, a fishing village; Atalia, the chief town, is omitted.

capadocia (F 40) (Ptol V 6), Cappadocia.

auria (F 40) seems to be a mutilated Caesarea, the mod. Kaisaria (Ptol V 6)

amafia (F 42), mod. Amasia.

trapezu (F 43), mod. Trebizonda or Tarabzon, with a Turkish flag (crescent in red). The last Byzantine ruler was beheaded by Mohamed II. in 1461.

schista (F 40), Sebastea of Ptolemy, mod Siwas.

colonia (F 42)?

cilicia (F 38) (Ptolemy V 7).

tarfus (F 37).

mani/ra (F 37), possibly Vesconti's Malinistra at the mouth of the Pyramus, or Jihun, the Malimistra on the Catalan map (1875) and of A. Benincasa (1476).

The only names, on Jomard's and Ghillany's "fac-similes" are Asia, Capadocia, Libia, Cilicia and a town Jarapia. Is this last a corruption of Caesarea?

cipern (F 35), Cyprus, with the flag of Venice. Cyprus was held by the Venetians (to whom it had been ceded by Catarina Cornaro, the widow of the last king of the House of Lusignan, in 1489) up to the year 1570, when the Turks conquered it.

CAUCASIA.

transitar fl. (F 47), on Jomard's facsimile only, is the name of a river which Ptolemy, V 9, calls Vardanus, our mod. Kuban.

zichi (F 43), the Zygi or Zichi of Strabo (II 31), the Zinchi of Ptolemy (VI 9), the Ziga of Pietro Visconte, the mod. Jigheti, in the western Caucasus.

phafis (F 46), Ptol V 9, the modern Rion. Jom has a Lafen fl. which reminds one of the Lazi, to the south of the Phasis (Pliny VI 8).

colchis (F 45), Ptol V 9, mod. Mingrelia.

Iberia (F 45), Ptol V 10, mod. Georgia.

albania (F 43), Ptol V 11, the South-eastern Caucasus towards the Caspian.

porta tefert (F 42), porta de feri, the Iron Gates, Jom and Ghil only.

ARMENIA.

armenia (F 40), Ptolemy V 12, M. Polo I 13.

fala (F 41).

arche Noe (F 41), the Ark of Noah on a lofty mountain, the Ararat, according to the ancient legends. It already figures on the Map of St. Jerome (Miller, III., 6).

mart (F 39), Mardi of Ptol V 13, M. Polo's. Maredin (I 13), mod. Mardin.

SYRIA.

Sijria (F 35), Syria.

harara (F 35)?

antiochia (F 38), far inland.

haleb (F 34), the ancient name of a town better known by its Italianised name of Aleppo, the Beroea of Ptolemy (V 15).

tripolis (F 33), mod. Tripoli.

fidon (F 32), mod. Saida.

tyrus (F 31), mod. es Sur, or Tyre.

damafcus (F 31).

palestina (F 29), Palestine.

Judes (F 29), Judea.

Jerusalem, not even the picture of a town is given, but a Saint (St. Peter?) kneels on its site (F 30).

neapolis (F 31), mod. Nablus.

gaza (F 29), mod. Ghuzzeh.

Mount Sinai is shown, but no name is attached to it.

BABYLONIA, ETC.

mesopotamia (F 35), Ptol V 17.
babilon (F 34), Ptol V 19.
caldea (F 31), with a coat of arms. Ptol V 19.
beym (F 33), in W. desert; Paris facs. only.
oliba (F 32), Jom and Ghil only.
zimbo (F 30), gamba of Jom and Ghil, Ptolemy's Jamba?
affiria (F 35 and 36), Assyria (Ptol VI 1). A coat of arms separates it from Parthia.

ARABIA.

The following names are from Ptolemy:
arabia deserta (F 30), Ptol V 18, the Syrian desert.
arabia petrea (F 27), Ptol V 16, the Sinai Peninsula, etc.
arabia felix (F 19), Ptol VI 7, Yemen.
albana (F 17), Albana (Ptol VI 7), mod. Khaçuf.
latha (F 15), Laththa (Ptol VI 7), mod. Kothbu.
iamocha (F 10), Jom and Ghil Amacha, Ptol Mardache, W. of Aden.
Ahamarna (F 25) perhaps Aramava, Ptol VI 7.
rhatip (F 27), Rhadu vicus (Ptol VI 7), Jom and Ghil only.
arno (F 27), Arre (Ptol V 7), mod. Hayil.
feira fabi (F 13), the Sabe regia, Ptol VI 7, mod Sab.
metrobol (F 13), perhaps Macpha metropolis, Ptol VI 7, mod Magfa.
Sia (F 12), perhaps Syagros Prom VI 7.
Other well-known places in Arabia:
mahometgrab (F 26), Mohamed's Tomb at Medina.
mecca (F 24).
saba (F 13), the traditional residence of the Queen of Sheba (1 Kings X.), now Jebel Saber, on the road from Aden to Marib. Jom and Ghil have a royal tent, instead of a patch of forest as on the original.
fochar (F 15), mod. Sohar, in Oman.
Islands on the coast of Arabia (Ptol VI 7):
jheiaia (F 26), Ichara, mod. Abu Ali I.
ocha (F 25), on site of Ptolemy's Tharo, mod. Tarut.
chilus (F 25), Tylus (Chilus of Ulm edition of 1482), mod. Owai (Bahrein).
serapion (G 19), Sarapidis I, mod. Masirah.
cinobo Infein (F 15), Zenobii I, mod. Kurlan Murian.
onganon (G 20), Organa I, mod. Masirah.
The following towns of Arabia, mentioned by Marco Polo (Pipino, III. 43-6, Ramusio III. 40-43, Yule's 3rd edition III. 36-39), are placed in Africa or India owing to a misprint or clerical error in Marco Polo's narrative, where Escier is said to lie S.E. (instead of N.W.) of Aden.
adem (F 12 in Africa, H 16 in India).
escier (H 17, in India) mod. Shehr.

dulfai (H 17 in India), mod. Dafar.
kalajati (G 21 in India), now Kalayati in Oman.
The following names I have not been able to trace elsewhere or identify:—
gurano (F 26), Paris facs. only.
maizoma (F 25), Jom and Ghil only.
erpi (F 23).
cargolo (F 22), Jom: *carguco*.
Erjant (F 22).
fagen (F 22).
fatna (F 22), Ghil: *falua*.
tac (G 23), Jom and Ghil only.
anec (F 20), do.
aleferes (F 17).
nabirri (F 18), Jom and Ghil only.
manna (F 17), identical with
mema (F 16), Jom and Ghil only.
henca (F 14).
thiuck (F 15).
bifa (F 19).
guro (F 21).
agraton (F 21).
neitra (F 22).
godosia (F 22), Jom and Ghil. Perhaps Gedolia, the country of King Balthasar according to Otto of Freisingen.
fanami (F 23), Ghil: *sanu vernitu*.
boro (F 21).
ibry (F 24).
feth (F 28).

PERSIA, ETC.

The following names are from Ptolemy:—
media (F 38), Ptol VI 2, mod. Irak.
idriara (G 33), Jom and Ghil: *adriacat*. Perhaps Andriaca, Ptol VI 2.
Sufana (F 31), Susiano, Ptol VI 3, now Khuzistan.
Sufas (F 32), Susa, Ptol VI 3, ruins 35 m. W.N.W. of Shushter.
gran (F 32), Graan, Ptol VI 3.
rasiana (F 28), Taxiana I, Ptol VI 3.
persia (F 32), Persis, Ptol VI 4, now Farsistan.
persepelis (G 32), Ptol VI 4, ruins 30 m. N.E. of Shiraz.
cherfanfy (F 30), Chersonesus extrema, Ptol VI 4.
jonan (F 34), Jonacapolis, Ptol VI 4.
tabiana (F 28), Tabiana, I., Ptol VI 4.
Joptha (F 29), Sophtha I., Ptol VI 4.
parthia (G 34), Ptol VI 5, now Khorasan.
caramania (G 32), Carmania, Ptol VI 8, mod. Kirman.
salis (G 26), Sabis, Ptol VI 8.
aria (G 32 and 34), Arai, Ptol VI 8, W. Afghanistan with Herat.
oragiana (G 22), tracpana of Jom and Ghil, Drangiana, Ptol VI 19, mod. Seistan.

asta (G 29), Asta, Ptol VI 20.

aracofio (G 30), Arachosia, Ptol VI 20, Eastern Afghanistan.

ostaca (G 29), Asiaca, Ptol VI 20.

parapafnia (G 36), Parapanisus mons, Ptol VI 18, now Kuhi Baba and Hindukush.

gedrofia (G 26), Gadoria, Ptol VI 21, mod. Baluchistan.

The following names are found in Marco Polo :—

taurif (F 38), M. Polo I 18, mod. Tabriz. East of it miniature of three travellers (the Polos with their nephew).

Jrak (F 39), M. Polo I 18.

spaan (G 39), M. Polo I 19 : Ystavith, mod. Ispahan.

schiraf (F 35), M. Polo I 19, Shiraz.

yasdi (G 34), M. Polo I 20 ; mod. Yezd.

comada (G 31), M. Polo I 22 : comandu, now Shahr i Dakianus.

ormus (G 26), on an island, and the names *Ormuf* and *Ormes* (G 24), on the mainland, at the mouth of the Sea of Persia, representing modern Ormuz (Hormuz) and the mainland, Harmozia of Ptolemy (M. Polo I 23-24).

tarman (G 31), M. Polo I 21, 24, should be Carman, the mod. Kirman.

arochain (G 38), called thymochayn in Pipino's version (I 27), tonocain or timochain in others, identified by Yule with the hill country (Kuhistan) between Tun and Kain, corresponding to Ptolemy's Hyrcania.

konikreich chesmakoran (K 26), M. Polo III 36, now Kej Mekran, to the west of the Indus. Behaim places it in China !

The following I have not been able to trace :—

heleu (F 37).

patuna (F 36).

bear (F 37).

maboro (F 39).

wifle (G 36). ? Wiiste, Desert.

carco (G 34), Jom and Ghil : Corus. Above it two kneeling figures and two travellers.

zang (G 39), Jom and Ghil only.

pinfa (G 39).

miraba (G 39), Jom and Ghil : Raba.

afateai (G 33).

ripa (G 35).

Jphanaea (G 30).

aha, on coast (F 29), Jom only.

mocha (F 30).

bona (F 33), Ghil only.

sopella (F 31), Jom and Ghil.

rota (G 30).

sedia (G 28).

cadro (G 27).

Jopa (G 24), Ghil : jarte.

luna (G 33), with a flag with three spread eagles.

getta, an island (G 19).

oragi (G 22), with a flag showing an anchor.

arizo (G 22).

baranka reg. (G 25), Jom : Karama reg, Ghil : parama reg. Perhaps Karamania ?

sandria (G 27).

arreda (G 29).

pabeij (G 28).

merocau (G 25).

Zodra (G 25).

patan (G 28).

INDIA INTRA GANGEM.

(Ptolemy VII., c. I.)

India intra Goge (G 24).

Indus fl. (G 22).

namand fl. (G 18), Jom and Ghil only ; Namadus flumen, mod. Narmada, at Bharoch (anc. Barygaza).

canafa (H 28), Carnasa (Kaisana) has been identified with Pliny's Cartana, a town on the Panjshir.

tampete (H 38), Lambatae, the inhabitants of mod. Lamghan, on the northern bank of the Kabul.

caspicia (H 36), Caspiria, mod. valley of Kashmir.

clindima (H 36), Cylindrimae, at the sources of the Ganges and Jamna.

pefule (H 33), Passala, mod. Bisauli in Rohilkhand.

trani (H 30), Toana, a town of the Nanichae, on the Jamna.

gangan (H 30), Gangani, which should be read, Tanganoe, an heroic race along the E. bank of the Upper Ganges.

mauage fl. (G 18), called *Ongonna* (H 26) in its upper course ; Nanaguna fluvius, mod. Tapti.

borig (G 15), Baris, but Ptolemy's Pseudostonis is thus named by Behaim, whilst a river described as

borig borie (H 14), Jom and Ghil : boriaat basis, corresponds to Ptolemy's Baris. They are both rivers of Limyrike, and enter the lagoons of Cochin or Quillon.

cardelis (H 17), Berderis (Bideris), perhaps Erod, near the Kaveri.

selur (H 17), Selur, a city of the Carcae.

folur (H 16), Ghil : Solusa, Solene fl, now river Tamraparni, which enters the Gulf of Manar.

zora archota (H 21), Sora Arcati. Sora is the northern Tamil country. Arcatus, mod. Arkad, was a city of it.

martha (H 21), Sangemarta, a town near the former.

fobara (H 15), Ghil : Isobara ; Sabura, now Cuddalore.

chabery (H 17), not a mountain but Chaberus fl., mod. Kaveri.

Cyma fl. (H 13), Tyna fl., identified with the Penn-ar.

Connafilla (H 12), Contacossyla, a town, inland, near the Krishna.

adisani (H 23), Adisathrus mons, the Western Ghats.

bozala (H 18), Cocala, in the Gangetic Gulf.

azoma (H 20), Ozoana, perhaps Seoni, 60 m. N.E. of Nagpur.

rafro (H 20), Castra, a town of the Salaconi, W. of the Godavari.

fogata (H 23), Sagoda, now Ayodhya or Audh.
defam (H 22), Dosara, mod. River Vaitarani.
daf gebirg (H 26), "the mountain" occupies the site of Uxontus mons, the E. continuation of the Vindhya.
maliba (H 27), Maliba, a city of the Adeisathri in central India.
ganges fl., *Ganges Aurea Regio* (H 20). Ptolemy mentions no gold in connection with the Ganges or the Gangaridae.
arcin regno (G 20), Jom and Ghil: arcia, Ariaca regio, Ptol.
nopoli (G 18), Deopali in Ariaca, mod. Devgad.
casta (G 22), perhaps Osta, a town of the Rhamnai.
zodra (G 25), Xodraca, E. of the Indus, in the Ran of Kachh.

In addition to the above the following localities, included by Ptolemy (VII 2) in India extra Gangem, are situated in reality within India as understood by us.
amnacha (H 34), Aminachae, Himalayan tribe, N. of the Brahmaputra.
torori (H 30), Tacoraci, now represented by the Dakhana and Dehra in Rajputana.
bereia (H 28), Boraeta, perhaps Bharoch in Audh.
das gebirg (H 28), these "Mountains" correspond to Bepyrus mons, that part of the Himalaya between the Saraya and Tista rivers.
dramas fl. (I 15), Ghil: damas fl., Doanas fluvius, now known as Brahmaputra.
ponoro (I 22), Posinara.
das gebirg damafi (I 30), Damasa montes, the Eastern Himalaya in Bhutan.
deana (I 35), Doanae, a tribe in Eastern Assam.

INDIA EXTRA GANGEM.

(Ptolemy VII., c. 2.)

India (H I 30).
cathabeda (H 20), Catabeda fl., the river of Chittagong.
tophiora (H 18), Jom and Ghil: Copicora with a flag (green with a red harp), Baracura emp., mod. Ramu, S.S.E. of Chittagong.
cora (I 17) Jom: iaca, Ghil: Coba and Lioro, a mutilation of Tocosana fl., mod. Arakan or the Naf.
befugu regio (I 13), and *Befugu Ara* (I 15) seems to stand for Basinga, a mart, a river, and a cannibal tribe, which has been identified with Bassein and its river.
teneda (I 8), Temgla, a city near Cape Negrais.
aucea chforefs (I 4), Aurea Chersonesus, a general name for the Malay Peninsula.
Syndo (I 13), Synda civitas and the Syndi, a coast town, near Pulo Sondur.
meandra gebirge (I 20), Meandrus mons, the Yuma chain in E. Arakan.
ferus fl. (I 20), perhaps the mod. Mekong.
valcitis regio (I 19).

calcitis regnum hic find vil golt perg (I 24), Chalceitis regio in qua plurima aeris metalla. This copper (not gold) country has been identified with the country of the Laos.

THE COUNTRY OF THE SINAË (SOUTHERN CHINA).

(Ptolemy VII., c. 3.)

Samandra das gebirg (I 31), Semanthinus mons, a fabulous mountain range to the East.
aspiata (I 26), Aspithra, a river, a town, and a tribe. Jom and Ghil name this river Cathabeda, the towns next to it topierra, and the river which enters the sea near it iaca or coba, all names which properly belong to the country East of the Ganges.
achabala (I 23), Achata, a town.
achatra (I 19), Achadrae, a tribe.
aramea (I 17), Brama, a town.
Itio . pi . agi (I 14), Ichthyophagi Aethiopes.
Jom and Ghil here show a town (Rhabana of Ptolemy?) with a flag, not visible on the original. These Ethiopian Fish-eaters seem to have occupied the coast of Southern China.

Then follows the following legend:—

Nit ferter hot uns tholomeus die welt befehriben aber ander hat uns Marco Polo und Mandavilla gefehriben. Ptolemy has described the world no further, but the remainder has been described by Marco Polo and Mandavilla.

surate (I 45) Ghil: Soram, Surata.
stare (I 5 s) Jom and Ghil: Stano, seems to stand for statio, the last word in the legend: "Cattigara Sinarum statio." This seems more reasonable than to assume a corruption of thinae or Sine. Cattigara has been identified with M. Polo's Quinsay, the mod. Hang-chau-fu, whilst the capital of the Sinae has been sought on the Hwang-ho (Lo-yang) or its tributary the Wei-ho (at M. Polo's Quen-zan-fu, the mod. Si-ngan-fu).
totaco fl. (I 8 s), Cotiaris fluvius, perhaps the river of Canton.

INDIA.

Place names according to Marco Polo:
bangala konikreich (K 42), *bāgala* (G 15), Bengal.
murfuli regio (J 13), *konikreich murfuli* (J 14 s), M. Polo III 29, with a royal tent and the following legend beneath it:

In vil von de gebirg find man edel-geftein und deamant aber um der schlangen willen find sie verkuemen. In many of the mountains are found precious stones and diamonds, but owing to the serpents they are!

Murfuli must be looked for on the Coromandel coast at Masulipatam; the precious stones point to the famous mines of Golconda.

maabar (I 12 s), on S.E. coast of India. See St. Thomas.

kael (I 10 s), M. Polo III 30, a town of Maabar, mod. Kayal in Tinnevely.

war *daf konikreich* (I 19 s), Far or War, mod. Warawar, is only mentioned in the Latin version of M. Polo's Travels (III 24):

das volkh dīses konikreich und landes waar geht naked und pettet ein ochfen an. The people of this kingdom and country War, go naked and worship an ox.

kumani (J 18 s), M. Polo III 32: Comari, usually identified with Cape Comorin, but J. Codine ('Mem. géogr. sur la mer des Indes,' 1866) advances reasons in favour of Calicut.

konikreich koulam (I 8 s), M. Polo III 31: coylū, Quilon.

konikreich dely (J 3 s), M. Polo III 33; near Mount Dely, N. of Cananor. On Doppelmayer's facsimile Tasib occupies the place of Dely.

hie in dīsen konikreich pettet daf volk opgotter an. Here, in this kingdom, the people worship idols.

lac en konikreich (I 14 s), M. Polo III 30: lach, other versions loac, lar. Yule identifies it with Ptolemy's Larica, which included N. Konkan and Guzzerat.

daf gebirg (I 16).

konikreich guzzerat (I 10), M. Polo III 35, Guzurath of Pipino's version.

kanem (I 7), M. Polo III 35, tana of Pipino, kanem of Ramusio, mod. Thana to the N. of Bombay.

konikreich kambaja (J 1), M. Polo III 36, with a royal tent. It is the Kambayet of the Arabs, our Cambay, an important trading town.

konikreich servenath, (J 13) M. Polo III 36, Pipino's version Semenath; now Pattan Somnath, opposite Diu. The legends about spices and musk, near Kambaja and Servenath are undoubtedly out of M. Polo, but do not refer to these countries, where no spices are found. They are as follows:—

hie ist allerlei Specerei und gewürz (J 7). Here are various kinds of spice and grocery.
In diefem wald wechft vil holt In this forest grows much wood
Specerein (J 11). (!aloe wood), spices.
do wächst moscat (J 3). Here grows nutmeg.

India potalis (J 10 s), or patalis, conjectured to mean open, accessible India, but no doubt the famous Patala (mod. Hyderabad) on the Lower Indus (Ptol VII 1), Pliny's Patalis or Patala (II 75, VI 28), Roger Bacon's and Pierre d'Ailly's Regio Pathalis in India, or Lasalle's Patalie regio, which in that author's rough map of the World is placed in a fictitious Southland.

Place names from other sources or not traced:

India fenda (H 25) Jom and Ghil: India penida, read India Secunda, i.e., India between Indus and Ganges.

telong p. (H 21), Jom and Ghil: teleng, Fra Mauro's Telenge, Friar Jordanus' Telenc, the Mohit's Telenga, acc. to Al. Cunningham ('The Ancient Geography of India,' (I. 519), Telingora, mod. Haidarabad.

himpela (G 14).

afpino (H 33).

horo (H 32).

raplin (H 31).

thama (H 29).

opo (H 29).

abafe (H 26), perhaps Ptolemy's Dabasae (VII 2), mod. Dimasas, on Mount Mandras.

cigote (H 26).

tholomais (H 23), Jom and Ghil: thalomanss.

corafte (H 19).

merabe (H 17), perhaps Ptolemy's Mapura (VII 1).

fifon (H 24), Sison crinitum a plant.

suto (H 24).

thizar (H 21).

roadfan (H 20).

nort (H 32).

capra (H 21).

carmo (H 29).

cadapa (H 27), mod. Kadapa in Madras, 14° N. 79° E.

taroa (H 33), Tarai?

geana (H 30).

gnanal (H 28).

mangeia (H 39).

munco (H 15).

cripa (H 14).

ceng (H 17).

catan (H 14).

jaebo (H 13).

tabit (H 12), Ghil: jabit.

Jario (H 14), Ghil: Jaria.

jobara (H 14).

mocoda (H 13).

orond (H 18), Oroudian mts., the northern section of the Western Ghats.

manago (H 13) is the maesolus fl. of Ptolemy, the Manada of the Ulm edition of Ptolemy (1482) and of Waldseemüller (1507).

FURTHER INDIA.

Ciamba konikreich (J 26), *ciamba* (K 26), mod. Cochinchina.

ciamba porto (K 24), perhaps mod. Phun-ri.

cyamba daf gebirg (J 7 and 17), mountains of Ciamba.

Ciamba ein konikreich do gibt mā corallen stat münz anfa (J 20). Ciamba, a kingdom where corals are used in the place of coin.

M. Polo (II 37) says this of Tibet, but not of Ciamba.

das konikreich Ciamba ist vol thier bifam thier do wachst vil mancherlei Specerei das holt aloe ebony das volk sind abgetter und haben befondere Sprach (J 18).

The kingdom of Ciamba is full of musk deer. Various spices grow there in plenty, also aloe wood and ebony. The people are idolaters and have a language of their own.

Neither musk nor spices are mentioned by M. Polo as products of Ciamba, but aloes, ebony and elephants.

loach (J 5 s); M. Polo III 11: *laach*, other versions *locac*; on the mainland: lower Siam.

daflant hot drey konik.

The country has three kings.

M. Polo only knows of one king.

The names Menam ken (J 5 s) in Loach, and Menam fl. (J 11 s), are found only on the Paris Globe (see p. 61).

The following are not mentioned by M. Polo; they may be in Tibet:—

lamacin fee (J 20), Jom and Ghil have a tent to the west of this lake which is not on the original. Waldseemüller (1507) has a Lama lacus.

lanna (J 12), a town. It is G. Leardo's Liana (1448), Waldseemüller's Lamia civitas (1507).

Incian fl (J 7). This river is shown as a headstream of the Caramoran.

Other places, apparently in Further India or, at all events, beyond the Ganges, are:—

naptas (I 22).

nijches p. (I 20).

das gebirg nijhen (J 24), Jom and Ghil: gebirg myter.

Jrab allt fl. (I 20), a river identical with Ptolemy's Dorius fl. (VIII 21).

regioza (I 20).

Disfama (I 38), perhaps Ptolemy's Adisaga in the valley of the Brahmaputra.

abef (I 30).

marco . . . (I 32), the beginning of an obliterated legend: Marco Polo. . .

thering (I 33).

jogan (I 32), perhaps Ptolemy's Sagoda (VII 2), mod. Ayodhya.

desar (I 33).

comaru (I 35).

trifact (I 39).

THE INDIAN OCEAN AND ITS ISLANDS.

Marco polo schreibt uns im 3 buch am 38 capitel dafs warlich die schiffleuth befunde seyen worden dafs in diesem indianischen merr ligen mer dan 12,700 insula di bewont sind und welchen findet vil mit edelgestein perlein und mit golt pergen andere vol 12 lei specerey und wunderlichen volckh dauon lang zu schreiben hie findet man vil meerwunder von Serenen und ander fischen. Vnd ob jemandt von diesen wunderlichen volckh und seltsamen vischen im meer oder thieren auf dem erdreich begert zu wissen der lese die bucher plini jfidori aristotele strabonis und specula vincenzi vil anderer lehrer mer.

Marco Polo in the 38th chapter of the 3rd book states that the mariners had verily found in this Indian Ocean more than 12,700 inhabited islands, many of which yield precious stones, pearls and mountains of gold, whilst others abound in twelve kinds of spices and curious peoples, concerning whom much might be written.

Here are found sea-monsters, such as Sirens and other fish. And if anyone desire to know more of these curious people, and peculiar fish in the sea or animals upon the land, let him read the books of Pliny, Isidor (of Seville), Aristotle, Strabo, the 'Specula' of Vincent (of Beauvais) and many others.

do findt man von den wunderlichen leuten in den inseln und auf dem meer von meer wundern und was seltsamer thier auf erdreich und in den inseln vil wuerzen und edelgestein wachsen (M 7).

There he shall find accounts of the curious inhabitants, of the islands, the monsters of the ocean, the peculiar animals on the land and of the islands yielding spices and precious stones. See p. 62.

TAPROBANA.

Taprobana (H 5), with a royal tent.

modin (H 9), Moda of Ghil.

scorria (H 8), fete of Ghil.

samia (H 6), Samfu?

cap frazio (H 6), captran of Ghil.

Taprobana von diser insel schreibt man man ynse vil edler ding in den alten historien wie sy alexander magno geholfen haben und gen rom zogen findet mit den romern und kaiser pompejo gesellschaft gemacht haben dise insel hat umbfangen 4,000 meil und ist getheilt in vier konikreich in welchen vil goldtes wechft auch pfeffer camphora lignum aloes auch vil golt/sandt das volk pet abgotter an und findt groff stark leut und gut astronomi.

Many noble things are said about this island in ancient histories, how they (the inhabitants) helped Alexander the Great and went with the Romans to Rome in the company of the Emperor Pompey. This island has a circuit of 4,000 miles, and is divided into four kingdoms, in which is found much gold and also pepper, camphor, aloes wood and also gold sand. The people worship false gods: they are tall, stout men, and good astronomers.

CEYLON.

Seilan insula ein der beste insul in der welt aber de mer hat sie abgeben muessen (I 30 s).

The island Seilan, one of the best islands in the world, but it has lost in extent to the seas.

In diser insell findet man vil edelgesteins perlein oriental der konik diser insul hat den groesten und schonste rubin den man in der welt je gefah dafs volkh gehet nakhet man und frauen kein korn wechft alda dan rais (J 38 s).

In this island Seilan are found many precious stones and oriental pearls. The King of this island possesses the largest and finest ruby ever seen in the world. The people, men and women, go naked. No corn grows there, only rice.

Jr konik ist niemant underworfen und betten abgotter an die insul Seilan hat im craiz 2,400 meil als enst schreibt marco polo im dritten buch am 19 capitel (I 46 s).

Its king is subject to no one, and they pray to false gods. The island Seilan has a circuit of 2,400 miles, as is written by Marco Polo in the 19th chapter of the third book.

Nem in vergangenen Jaren schickht der groe kaiser incathay ain pot/chafft zu disen konik von seilan lise an in begern zu haben disen rubin sich erpienten groesen schatz dafur zu geben also gab der konik zu antwort wie dafs diser stein seiner vorfahren so lang gewest wer so stündt in ebel an dafs er der solt sein der diesen stein dem landt solt empfrembten der rubin soll anderthalb schuh lang sein und ain spann breit on alle mackhel (I 19 s).

Item, in past times the great Emperor of Cathai sent an ambassador to this King of Seilan, asking for this ruby and offering to give much treasure for it. But the King replied that this stone had for a long time belonged to his ancestors, and it would ill become him to send this stone out of the country. The ruby is said to be a foot and a half in length and a span broad, and without any blemish.

Marco Polo's Seilan is undoubtedly our Ceylon, and all that is said will be found in Pipino's version III 22, in Ramusio's III 19.

NEKURAN—(NECUVERAN).

Neuucan Insula (J 24 s), *neucuran* of the legend, Pipino's *Necuran*, the *Necuveran* of other versions, is generally identified with one of the *Nikobar Islands*, and is undoubtedly the *Nicoveran* of *Odorico* of *Pordenone*, the inhabitants of which have dog-faces like those of *Marco Polo's Angaman*. This identification I accept. Prof. G. Schlegel ('*Problèmes Géographiques*,' No. 16) identifies it with *Nakur* of the Chinese, that is *Sumatra*, the inhabitants of which are similarly described as having dog-faces.

im dritten buch von marco polo am 20 capittel findet man geschrieben das diese Insel neucuran genant ligt bey 150 welsche meil von der insel Java maior und in derselben insel wachsen die muscatt zimeth negel vast vil auch findet daselbst waldt von lautter sandelholz und von allerlei specerey (J 10 s).

In the third book of Marco Polo chapter 20, it is stated that this island *Neucuran* is at a distance of 150 Italian miles from the Island *Java* major, and that nutmegs, cinnamon and cloves grow plentifully in that island, and that there are forests of sandal wood and of various spices.

Pipino's version of Marco Polo is correctly quoted.

hie ist gefunden worden zu Johan de Mandavilla seiten ein Insel mit volk die alleleich hundsthaup ketten und da mag man den meerstern der bey uns geheissen ist polus arcticus nit sehen di da faren auf dem meer müssen nach dem astrolabio segeln dann der compass nit zeigt (H 33 s).

Here was discovered in the time of John de Mandavilla an island inhabited by men having dogs' heads, and there the Sea-star, called *Polus Arcticus* by us, is not visible, and those navigating the sea must do so with the help of the *astrolabe*, for the compass does not point (see p. 14).

Friar Odorico, c. 24, describes the inhabitants of *Nicoveran* as having dogs' faces; *Mandeville*, c. 18, improving upon this, gives them dogs' heads.

The second part of the legend refers to a superstition of the Middle Ages, according to which the magnet failed to point to the north as soon as the lodestar sank below the horizon. *Marco Polo* (I 1) and *Nicolo Conti* merely state that the compass is unknown to the sailors in the *Indian Ocean*.

ANGAMAN.

Angaman Insula (K 35 s), one of the *Andaman Islands*.

ritroni (ridrani of Jom and Ghil).

Im letzten buch marco polo im 16 capittel findet man geschrieben das die volckh in diser insul angama genant hab hundte haupt augen und zahn gleich wie die hundte und das es vast ungestalt leutt sollen sein und wildt van sy vast lieber menschen fleisch essen dan ander fleisch den reise essen sy an brot statt mit milch gekocht sy getten apgötter an und haben allerley specerey fast vil die bey jnen wachsen und frucht die den fruchten in unsern landten vast ungleich sollen sein.

In the last book of Marco Polo in the 16th chapter it is written that the people of this island *Angama* have heads, eyes and teeth like dogs, and are much mis-shapen, and savage, for they prefer human flesh to other flesh. They eat rice cooked in milk instead of bread, worship idols, and various kinds of spices abound on the island, and fruits said to be very different from the fruits of our country.

This information is taken from *Ramusio's* version, III. 18.

ISLANDS OF THE SATYRS.

die in diesen Inseln wohnen hab schwenz gleich die thier wie pholomeus schreibt in der aiffsten tafel von asia (I 42 s).

Those who live in these islands have tails like animals, as described by Ptolemy on tab. XI. of Asia (lib. VII., c. 2).

These are Ptolemy's "*Satyrorum Insulae tres*" "*quarum incolae caudas habere dicuntur*," at the opening of the *Sinus Magnus* (*China Sea*). They may be the *Anamba Islands*.

CANDYN.

Insula Candyn (L 25 s).

dise insel candyn mit sambt den andern insulen so java minor und angama und neucuran pentham seilan mit sambt der hohen india Sant thomas landt liegen so vast gegen mittag das der polus arcticus daselbst nimmer mer mag gesehen werden aber sy sehen ein ander gestirn geheissen antarcticus, das macht das daselbst landt ligt recht fufs gegen fufs gegen unser landt über und wen wir tag haben so haben sy nacht und so uns die son undergeht so haben sy iren tag, und das halb theil des gestirns das under uns ist das wir nit sehen das sehen sy, das macht das alles das die welt mit sambt dem wasser von runder form von got geschaffen ist so beschreibet Johannes de Mandavilla den lies in sein buch am dritten theil seiner meerfahrt.

This island *Candyn*, together with the other islands, *Java minor*, *Angama*, *Neucuran*, *Pentham* and *Seilan*, together with *High India*, the country of *St. Thomas*, are situated so far to the south that the *Polus Arcticus* is no longer visible. They see, however, another star called *Antarcticus*. This is because this country lies foot against foot with respect to our land, and when it is day with us they have night, and when the Sun sets with us they have their day, and that half of the stars, which are beneath us, and not visible to us, are visible to them. All this is because God has created the world together with the water of a round shape, as described by *Johannes de Mandavilla* in the third part of his voyage (C 17).

Candyn is usually identified with *Odorico's Dondin* or *Duarte Barbosa's Dandon* (*Andam*). *Dr. Hamy* ('*Études*,' p. 162) identifies this island with *Ombira*, S. of the *Moluccas*; *Romanet du Caillaud* with the *Philippine Islands*; and *A. Gummé* ('*Le Dondin et les Philippines*,' *Barc.*, 1897) with *Ceylon* or one of the *Sunda Islands*. On the *Genoese Pitti Palace Map* (1457) we read that a monster fish was taken in the *Indian Ocean*, at *Candia*, and taken to *Venice*. May not this *Candia* be identified with *Candyn*?

THE MAGNETIC ISLANDS.

dise insell findt zehen gehaisfen maniole daselbst mag kein schiff faren das eisen an hat umb dese magnet willen der daselbst wechelt (K 5 s).

There are ten of these islands called *Maniole*. No ship having iron in it dare navigate near them because of the magnet which is found there.

Ptolemy (VII. 2) has "*Maniolae insulae decim, quarum incolae sunt anthropophagi, in his gignitur magnes*." These *Magnet Islands* of Ptolemy, however, are placed in the *Sinus Gangeticus*, whilst *Behaim's* legend is shifted to the east of the mainland.

On fabulous *Magnet Rocks*, to be dreaded by mariners, because on approaching them the iron nails flew out, and the ship fell to pieces, see *Peschel's* essay in '*Abhandlungen zur Erd- und Völkerkunde*,' Leipzig, 1877, p. 44.

SILVER, GOLD AND PEARL ISLANDS.

argira (L 3 s), Argyra, the Silver country (Ptol VII 2).

Crisis (L 8), Chryse, the Gold Island (Ptol VII 2).

thilis (L 12), Tylos, the Island of Pearls (Ptol VI 7).

Ptolemy's Argyra is Arakan, the Chryse or Aurea Chersonesus, the Malay Peninsula, and Tylos, an island in the Gulf of Persia. The last, which according to Pliny (VI 32) was famous for its pearl fishery, is no other than Bahrein.

Isidor of Seville (see Miller VII, Tafel 2) places the three islands beyond Taprobana, in the Oceanus orientalis.

CIPANGU.

Cipangu insula (L 23), Japan. There is a royal tent. At its northern extremity are shown a *moscat nufwall* (nutmeg forest) and a *pfeffer walt* (Pepper forest).

The following legends are on the Island itself:—

Cipangu insula hat ein befondern konik und sprach betet aggotter an.

The island Cipangu has a King and language of its own; the inhabitants worship idols.

Cipangu do wächst vil gold.

Cipangu where grows much gold.

Cipangu di edelst und reichst insel in oriente von specerei und edelstein roll hot umfang bei 1,200 meilen.

Cipangu is the most noble and richest island in the east, full of spices and precious stones. Its compass is 1,200 miles.

Off the southern extremity we read:—

in diser insel do wechst gold und gewürz stauden.

In this island are found gold and shrubs yielding spices.

Off the east coast is the following legend:—

dise insel zipangu ligt in orient der welt dafs volk afn landt peth abgotter an. Ir konik ist niemand underthan in der Insel wechst über-trefflich vil goldis auch edelgestein perlein orientel, dise schreibt marco polo von venedig im 3 buch.

This island Zipangu lies in the east of the world. The inhabitants worship idols. The King is subject to no one. In the island is found exceeding much gold and likewise precious stones and pearls. This is stated by Marco Polo of Venice in his 3rd book.

THE INDIAN SPICE TRADE.

The long legend (F G 1 s) on Behaim's globe is all we know about one Bartolomeo Florentino, who claims to have travelled for twenty-four years in the East, and who, on his return to Venice in 1424, is said to have rendered an account of his adventures to Pope Eugene IV. I am inclined to doubt the veracity or authenticity of this narrative. Eugen IV. only became Pope in 1431, but as he was a native of Venice, this Florentine adventurer may have met him there. It is, however, quite incredible that a merchant practically acquainted with the eastern spice trade should state that the spices, on their way to Venice, successively passed Java Major, Seilan, "where St. Thomas is buried," Aurea Chersonesus, Taprobana, Aden and Cairo. Nor is it likely that spices intended for England and France were sent by the overland route

through Germany. Already in 1315, if not earlier, Genoese vessels employed by Florentine merchants traded with Antwerp,¹ and three years later five Venetian galleys laden with spices and drugs arrived at that port.

In 1320 letters of protection were granted to Venetian vessels sailing for Antwerp or Bruges, and in 1332 the Great Council of Venice ordered that carriage overland should be permitted only in case the sea-route should be unsafe (Marin, 'Com. de' Veneziani,' V., p. 309). Of course, spices intended for Germany were sent at that time from Venice across the Alps to Augsburg or Nuremberg.

Item efs ist zu wissen dafs die specerei die in den inseln in indien in orienten in manicherley hendt verkauft wüdt eho sy heraus kumpt in unser landt.

Item, be it known that the spices pass through several hands in the islands of oriental India before they reach our country.

1. *erlich die inwohner der insel genant Java maior die kauffen sy in den andern inseln da sy gefambelt wüdt bey ihren nachpawen und verkauffen sy in ir insel.*

1. First, the inhabitants of the island called Java Major buy them in the other islands where they are collected by their neighbours, and sell them in their own island.

2. *Zum andern die von der insel seilan do st thomas begraben ligt kauffen die specerei in der insel java und bringen sy in ir insel.*

2. Secondly, those from the island Seilan, where St. Thomas is buried, buy the spices in Java and bring them to their own island.

3. *Zum dritten in der insel Ceylon und Seilan wüdt sy wider entladen vegold und verkauft den kaufleuten aus der insel aurea chersonesus do wüdt sy entladen.*

3. Thirdly, in the Island Ceylon or Seilan they are once more unloaded, charged with Customs duty, and sold to the merchants of the island Aurea Chersonesus, where they are again unloaded.

4. *Zum vierten die kaufteut der insel taprobana genant kauffen und bezohlen die specerei dafelst und bringens in ir insel.*

4. Fourthly, the merchants of the island Taprobana buy the spices there, and pay the Customs duties, and take them to their island.

5. *Zum fünften die heyden machmet gelauffen köffen aus dem landt aden dahin und kauffens und versoh-lens und fürens in ir landt.*

5. Fifthly, the Mohammedan heathen of Aden go there, buy the spices, pay the Customs and take them to their own country.

6. *Zum 6ten die von algeyro kauffens und fürens über mör und fürtters über land.*

6. Sixthly, those of Cairo buy them, and carry them over the sea, and further overland.

7. *Zum 7 fo kauffens die Venediger und andere.*

7. Seventhly, those of Venice and others buy them.

8. *Zu 8 so wüdt sy in venedig wider verkauft den teuschen und versolt.*

8. Eighthly, they are again sold in Venice to the Germans, and customs are paid.

9. *zu 9 zu frankfurt prugh und andern ortten.*

9. Ninthly, at Frankfurt, Bruges and other places.

10. *zum 10ten in engellandt und frankreich.*

10. Tenthly, in England and France.

11. *Zum 11 so kummen sy erst in der kremer hendt.*

11. Eleventh, thus at last they reach the hands of the retail traders.

12. *[Zum 12. fo von den kreinern kauffens die von den die Specerei gebraucht wüdt, dabey soll jederman vermerken die grofen zoll und den gewin.] die 12 malen auf die specerei geht und zu mermalen von zehen pfundten eins muess geben zu zoll darbey zu verfehen ist das in den*

12. Twelfthly, those who use the spices buy them of the retail dealers, and let the high Customs duties and profits be borne in mind which are levied twelve times upon the spices, the former amounting on each occasion to one pound out of every ten. From this it is to be under-

¹ So says Pegolotti, who resided there as a partner of the Bardi of Florence.

² Words within brackets omitted on Paris facs., but given by Murr.

landt inorienten fast vil mife wachfen und wolfeil mife fein und das nit wunder wer man wis fy by enfs den goldt geleich dis findt die wortt mifer bartolomei florentini der aus indien kommen was anno 1424 und eugenio den vierten babst zu venedig erzelt was er in 24 jaren in orient gefehen und erfahren hat.

stood that very great quantities must grow in the East, and it need not be wondered that they are worth with us as much as gold. These are the words of Mr. Bartolomeo of Florence, who came out of India in 1424, and told Pope Eugene IV. at Venice what he had seen and experienced in twenty-four years.

INNER ASIA.

The following information is derived exclusively from Ptolemy's geography :—

SACARUM SITUS.

(Ptolemy VI., c. 13.)

sacha regio (H 41). The Sacae are the ancestors of the modern Kirghiz and lived in the Western Tien-shan and the Steppes to the west.

irmaus das gebirg (H 38), *mualis montes* (H 55), *pont mantes* (H 45); Imaus mons, the western Himalaya and the northern extension as far as the Tien-shan.

comade (H 37), Comedae, to the east of Bactriana.

bilto (H 36), Byltae, represented by the mod. Balbi on the upper Indus, within the Himalaya.

comena (H 29) (comau of Ghil), Comari, on the Yaxartes.

montes lapidio (H 40), Turris lapidea, with a picture of the tower, far away, (I 28) still known as Tash-kurghan, "Stone Tower," on the route from Badakhshan to Kashghar.

SCYTHIA.

(Ptolemy VI., cc. 14 and 15.)

zithia (I 55), Scythia.

Sithia ultra ume motem (H 47), Scythia extra Imaum, Chinese Turkestan.

rectoseres (H 51), Tectosaces, a tribe far to the north of the Iaxartes.

tapires (H 43), Tapuraci, north of the Iaxartes.

de morides (I 55), (Jom and Ghil: oehardo), *occa* (I 55), *orazdes* (I 47), (Ghil: oehardo), the Oecharides of Ptolemy, conjectured to be the Tarim.

auraciarn montes (I 51), (Jom and Ghil: aus Scoram); Auzaciorum montes, perhaps part of the Tien-shan.

SERICA.

(Ptolemy VI., c. 16.)

secarum regio (I 44), Serica regio, i.e. Northern China.

anam montes (I 58), Jom and Ghil: umibi mento; Anniba montes, to the N. of Serica, part of the Tien-shan.

tasy montes (I 43), Casii montes, the mountains of the Casii, a tribe bordering on Kashmir.

muri montes (I 46) Ghil: camuri m.; Asmirei montes, in Kashmir.

bautisig fl., *baungs fl.* (I 41 and 43) Jom and Ghil call it Rüsige fl. Bautisus flumen. This river flows through the country of the Bautae (Bhota, i.e., Tibetans), and may be the Upper Brahmaputra.

octocora regio (I 36), Ottorocora. Uttara Kura, a mythical region of the Hindus, where spring is perennial.

stotoras (I 36), Ottorocoras mons, strangely mutilated.

WESTERN TURKISTAN.

On the Paris facsimile the rivers flowing into the *hyrkansische mer* from the east are called Jemba, Sir and Amu, and the town near the *mer* is called Chiwa. These names are not to be discovered on the original at Nürnberg, nor are they given by Jomard or Ghillany, and I have therefore omitted them. The Amo fl. (Amu) is already named on the Catalan map (1375).

badriani (G 44), Bactriana, Ptol VI 11.

tarispa (G 42), Zarispa, Ptol VI 11.

alexandria (G 43), Alexandria Oxiana, Ptol VI 12, on Jom and Ghillany's facsimiles a second Alexandria—Alexandria zeluma (ultima)—is shown as lying to the south of Alexandria Oxiana. They omit *clementi* (clemenfu, H 41).

Sago and Sagoi gebürg (G 45), the latter only given by Jom and Ghil, may be identified with Sogdii montes of Ptolemy (VI 12).

dogum (G 44), M. Polo I 32. Yule reads Dogana and identifies it with a village Dehana in the Ghor district.

balach (G 37), M. Polo I 32, also *Balk* on the Amu (G 42), the mod. Balkh.

Balafchan (G 37), M. Polo I 34, Badakhshan.

bafcia (G 39), M. Polo I 35, a district on the road from Badakhshan to Kashmir.

focan (G 39), *vocany* (H 26), M. Polo I 37: Wakhan.

panan or *kanan* (I 40), M. Polo I 37, should be pamer, and represents the Pamir Plateau.

beloro (G 41), M. Polo I 37: Bolor Tagh, the mountains between the Hindu Kush and the Tien-shan.

Samarcan (G 33), M. Polo I 39: Samarkand, placed by Behaim in the middle of Persia!

crase (H 45), on the site of Ptolemy's Cyroschata.

corpari (G 40).

danco (G 38).

bari (G 38).

infim (G 42).

onejam (G 50), with a tall man and two boys near him. Can this be the "Uncan" (Vang-Khan) whom Marco Polo identified with Prester John!

TARIM (EASTERN TURKISTAN).

Marco Polo's Turkestan extends from Samarkand in the west to Lop in the east.

turkestan (G 46) is shown as a town and not as the name of a country.

The towns of Cascar (Kashghar) and Carchan (Yarkand) are omitted on the globe, but the following legend referring to the inhabitants has found a place there (M. Polo I 40):—

hie wonè leut dè haben groff füß Here live people who have big
(I 51). (swollen) feet.

Koan and *kotan fl.* (H 32), mod. Khotan. M. Polo does not mention a river.

pagu (J 45) which Pipino (I 42) calls more correctly peyn, has recently been identified by Dr. Stein at Ulum Tali, between Khotan and Kiria.

lop (H 41), a station near Lobnor.

The following legends refer to the great desert of Gobi (M. Polo I 44):—

dise waltung grenzt an das tramontana und ist breit etli tagreis und 360 tagreis lang (H 56). This forest (desert) borders upon the tramontana and is several days across and 360 days' journey in length.

Jom and Ghil have "wildnus" (desert) instead of "waltung."

Marco polo vñ venedig jm ersten buch in dē XLIIII. capitel sagt das dise welter man in einen ganzen Jar von orient bis an occidenta keinen mag durch zihen wan si hebt sich an in reuffen negarten und weit bis in one gen cathai (H 58). Marco Polo in the 44th chapter of his first book (Pipino's version) tells us that these forests cannot be traversed from east to west in a year, for they begin at Novgorod in Russia and extend far towards Cathai.

The extent of this desert is much exaggerated by M. Polo as a glance at a map shows. He does not speak of forests or woods, but of a wildness or desert.

TARTARY.

The name *Tartaria* is inserted no less than eleven times between the River Don and the extreme east of Asia (F—K, between 42 and 56).

dis ist das lant das dē grofen tamerlan hat zugehert ein herr in tataria (G 56). This is the country which belonged to the great Tamerlan, Lord of Tartary.

Timur Lenk, popularly known as Tamerlan, made himself master of Transoxiana, in 1369, choosing Samarkand as his capital. At his death, in 1405, his empire extended from the Black Sea and the Mediterranean, far into Asia.

tangut das konikreich in tartaria (J 56), Tangut a kingdom in Tartary.

tangut regio (I 41), *tanguth* (J 50).

das grof gebirg des landes tangru (K 54), the big mountains of the country of Tangut.

Tangut is the Tartar name of the Chinese territory of Si-Hia, or "Western" Hia, which included part of Shensi, Ortu, Sha-cheu, Kukumor and the region towards the Lob nor. Jinghiz Khan, in 1226, destroyed this empire (Marco Polo, I 45).

There are miniatures of a royal tent, of two camels, and of two bears kissing each other.

tangut und camul do wil kein konik juncfrau zu ehe haben do pringen dñ mutter jhre tochter dñ fremden koufleuth zu welche mer man verführt hot dñ helt man für die fünemst tugend (I 50).

In Tangut and Kamul no king will take virgins in marriage. The mothers there offer their daughters to the foreign merchants, and she among them who has seduced most men is looked upon as the most virtuous.

Marco Polo refers to this custom in connection with Kamul (Pipino's version I 46), a town of Tangut, Tibet, (II 36) and Kaidu (II 37).

sakion (J 41), mod. Sha-chau (M. Polo I 45).

kamul (J 49), mod. Hami (M. Polo I 46).

succuf, succus (J 47), M. Polo I 48: Succuir, mod. Suh-chau.

heir wechft reobarbara gar vil.

Here grows very much rhubarb.

kampion (J 47), the capital of Tangut, mod. Kanchau (M. Polo I 49).

ezina (J 50), a town on the river Ezina or Heishui, to the east of Suhchau (M. Polo I 50).

Egrimul, egrimul das konikreich (J 48), or, more correctly, Ergimul (M. Polo I 63), a kingdom in Tangut, identified with mod. Liang-cheu, at the great wall.

singui, singrai (J 49), M. Polo I 63; mod. Si-ning, in western Kansu.

egrigaia (J 58), a district, M. Polo I 64, mod. Ning-hia.

calacia (J 52), a town in Egrigaia, at the foot of the Ala-shan.

karakorum (I 42), up to 1260 the capital of the Empire founded by Jinghiz Khan, and again of the Mongul dynasty expelled from China in 1368. Its ruins on the Orkhon were identified by Paderin in 1872 (M. Polo I 51).

bergi ein konikreich (K 53), *bergi* (K 50), with a royal tent.

das grof gebirg bergi (K 59), the "big mountains of Bergi." M. Polo (Pipino's version I 62) wrote Bergi, but other versions call this region Bargu. It was named after the Barkut, a clan of Mongols, which lived on the Selenga and to the east of Lake Baikal. M. Polo calls this country a "plain sixty days in extent," and does not mention mountains, the existence of which may have suggested itself to the compiler of the globe by the name Bergi.

Of a legend to the north the first two words only—in *difen* (in these)—are now legible.

On the Paris facsimile the names of Lena, Kolyma and Amur are given to three rivers flowing to the north. These names owe their existence to the want of intelligence of the copyist.

in difem kreis difer wiltniff fengt man dñ herwepels laffia zobel und mader und ander keftlich fehwerk auch falcken und jeesalken da ist es fo

Within these barren grounds are caught ermines, weasels, sables and martens and other valuable peltry, also hawks and merfalcones. It is

halt das di leut ihre heuser machen in gruben unter das erreich und bedeckens mit pain [hier] heuten und steigen mit leidern in die heuser hinab (F 65).

Marco polo am 48 capittel jm dritts buch am endte schreibt uns das die gegen tramontana in dem gepürg und wildnuse umb den meer stern sey ein volck wonhaft von tartaren genant permiani welche anbetten ain abgott von filz gemacht genant natigay dises volks nahrung ist pin fum mer ziehen sy nortwärts in das gepürg unter den etern polus articus genant und fahen die zobel mader und harmelin lassiz fuchs und ander gethier das flaisch davon ist ir speis und die heute find ire klaidir im sommer woenen sy in den felsen umb der jegerrey willen und so es winter will werden en so ziehen sy gegen mittag wartz gegen reuffen und haben ire heuser in gruben under der erden umb des kalten windes willen genant aquilon und bedecken die gruben mit gethierheuten und bei in ist es im winter felten tag aber in summer verliese sy der sunnen schein die ganze nacht nimmer als bei uns miten sußer ist so wechelt bei inen ein wenig gras und krouter die sy essen aber korn noch wein noch obs wil daselbst nit wachsen umb des grofsen frosts willen (J-M 76°N.).

item als die reuffen in dasselbe land wollen das köplich fehwerk zu holen so müssen sie auf schlitzen fahren um der wasser (moffer) und tieffen enes willen welche von grofsen hunden gezogen werden (K 50).

Near the North Pole we read:—

das lant ist bewont im soimer (H 84).

This country is inhabited in summer.

hie fecht man weisen valken (J 85).

Here are caught white hawks.

The information given above has, in the main, been taken from chapters 48 and 49 of book III. of Pipino's version of Marco Polo. The God Natigay is referred to in Book I., c. 58, and the hawks are spoken of in Book I., c. 62. Identical information on the Permiani is given on Fra Mauro's map. See also the legend on Mangu-Khan.

CATHAI.

cathai (K 44), *cathajo* (K 43), *cathai* (M 40), the last an island in the eastern ocean.

hie hebt sich das lant cathaja (J 40). Here begins the land cathaja.

Cathai was the mediæval name for northern China, thus called after the Khitai, a Manju tribe, on its northern

so cold there that the people have their houses in pits underground, which they cover with hides, and into which they descend on ladders.

Marco Polo in the 48th chapter of the 3rd book, at the end, says that in this region Tramontana in the mountains and the barren grounds around the Pole Star, there lives a people called Permians by the Tartars, who worship a god made of felt and called Natigay. The food of this people is [here several words have been omitted] In the summer they move northwards into the mountains under the star called Polus arcticus, and catch sables, martens, ermines, weasels, foxes and other animals. The flesh of them is their food, and the skins furnish their clothing. In summer they live among the rocks for the sake of hunting, but on the approach of winter they move south, towards Russia. Their houses are in underground pits, because of the cold aquilon (North) wind, and they cover the pits with hides, and in winter daylight with them is rare, but in summer the sun shines the whole night through. When it is midsummer with us, a little grass and herbage grow with them, which they eat, but neither corn, nor wine, nor fruits grow there because of the great cold.

Item, when the Russians wish to go to this country, to fetch the valuable peltry, they are obliged to travel on sledges drawn by big dogs, because of the waters (swamps) and the deep snow.

border, and its rulers, as the Leao or Iron dynasty, up to 1228.

tenduk (J 37), *og* (J 38), and *magog* (J 34); see Prester John, pp. 95, 96.

sindichin (K 45), M. Polo I 65, mod. Slen-hwa-fu.

Jdifu (K 47), or Ydifu, Yelifu, probably in the mountains N.E. of Kalgan, ein böses gebirg (difficult mountain) on the globe.

cianga nor (J 31), the "white sea," now ruins of a royal palace at Chagan Balgasum, 30 m. north of Kalgan.

vandu (J 31), Pipino, I 66, spells more correctly Cyandu, Ramusio Xandu. A famous royal palace, built by Kublai Khan, formerly known as Cle-men-fu, which is clearly the *clementi* of the globe (H 41), which M. Polo refers to in book I 6.

kambalu (K 42), *kazabula*, a little to the west, a misprint, the famous capital of Cathai (M. Polo II 10), now known as Peking.

taidu (K 41), or more correctly Tatu, the Tartar quarter of Peking, to the north, not south as shown on the globe (M. Polo II 11).

giogiu (K 43), *gingui* (J 40), Pipino's Juju, south-west of Peking, now Cho-chau in Pechili.

tainfu (K 40), now Tai-yuen-fu in Shansi.

achbalak (K 45), M. Polo II 28, now Ching-ting in Chili.

pianfu (K 39), M. Polo II 29, now Pin-yang-fu in Shensi.

taigin (K 37), M. Polo II 30, now Tai-ching-kwan on the Hwang-ho in Shansi.

kacianfu (K 39), *kocianfu* (K 39), M. Polo II 32, now Pu-chau-fu in Shansi.

ciangli, *cianglu* (K 34), M. Polo II 50, now Tsi-nan-fu in Shantung.

quenzanfu (K 33), M. Polo II 33, now Si-ngan-fu in Shensi.

kunkin (K 32), M. Polo II 34, a district on the Wei or the Han in Shensi.

pazanfu (J 39), M. Polo II 49.

tagiu p. (I 38), Jom and Ghil: *tagni p.*, *tagui p.* This seems to be Marco Polo's *taigui* (Pipino's version, II 30) or *taigin* (Ram. II 31), where Jinghis Khan was killed, and which Yule identifies with Ho-chau in Se-chwan.

MANGI.

konik v. mangi (K 35), King of Mangi in his royal tent, still traceable on the globe, but omitted on the Paris facsimile. Mangi or Manzi, corrupted from Men-tseu, i.e., Barbarians, is the name given by the Northern Chinese to their southern kinsmen (Cordier).

kailgan (K 31), M. Polo II 55: chorgungiu, now Hwai-ngan-dan on the Imperial Canal.

kain (K 30), M. Polo II 56, now Kao-yu-chau, east of the canal.

jang-gui (K 29), M. Polo II 57, now Yang-chau.

nang-hin (K 28), M. Polo II 57, now Ngan-king.

sajanfu (K 29), M. Polo II 58: *sianfu*, now Siangyang-fu on the River Han.

The following legend may refer to the Nestorian Christian found by M. Polo (II 61) at Cygianfu (Chinghian-fu on the Lower Yang-tze), although that important commercial town is not shown on the globe:—

hie findt vil chriften und heiden Here are many Christians and
die apione beten gott im himel an heathen who worship idols and God
(K 33). in Heaven.

The legend is clearly corrupt; instead of *apione* we might read *apgetter*, but Jomard's reading (. . . *die aber neben ihren Gott den Himmel anbeten* . . . that is, who in addition to their god worship heaven), is a clever emendation.

quinsai (K 27), M. Polo II 64, the capital of Mangi, now Nang-chau-fu.

lapinzu (K 27), M. Polo II 66, now Shao-ningfu.

gengui (K 30), M. Polo II 66, now Kiu-chau.

zengich (K 30), M. Polo II 66: *zengian*, now Sui-chang.

gioza (K 33), M. Polo II 66, now Kiu-chau.

quelinfu (K 25 and 30), M. Polo II 68, now Kien-ning-fu.

das konikreich conchia (K 29), M. Polo II 67, and *koncha* (K 31); this kingdom included the Kiang-si and Fokien.

fugiu (twice, K 28 and 30), M. Polo II 69, the capital of Koncha, mod. Fu-chau-fu.

nguin (K 27), Pipino's II 68: *ungue*, in Koncha, mod. Hu-kwan.

tingui (K 40), M. Polo II 70, mod. Ting-chau-fu in Fokien.

zaitun (K 26), M. Polo II 70, the famous seaport, now Chang-cheu.

achbalak macnis (K 31), M. Polo II 34: *achbalach Mangis*, i.e., the white town of Mangi, on the River Han in S. Shensi.

sidiifu (K 31), M. Polo II 35, now Cheng-tu-fu, in Su-chwan.

sindiifu (J 40) is identical with the preceding.

citigui (J 41), M. Polo II 49: *cinguy*, now Siu-chau-fu, in Su-chwan.

orgui ein mächtig lant (K 49), *orgui*, a mighty country, is probably a corruption of M. Polo's Singuy.

tholoman (J 37, K 48) M. Polo II 48, the Kolo tribe, near Ta-ting-fu in Kwei-chau.

der berg tolamein (J 43), the mountains of Tholoman.

tolak ein konikreich (J 46), Jom and Ghil: *tolor. Tolak* a kingdom, a corruption of *toloma* (M. Polo II 48)?

anin (K 43), M. Polo II 47, in Pipino's and Ramusio's versions called *Amu*, *Anin* in that of Pauthier. Yule adopts *Anin*, which he identified with the Ho-nhi tribe on the road from Tong-king to Yun-nan.

kangigu (K 45), M. Polo II 46: *canzige*, according to Yule a district in East Tibet, but if we allow ourselves

to be guided by the route followed by M. Polo (II 46) it should be sought for in the country of the Shan.

cardandam (K 28), M. Polo II 41, *ardandan*, a province of which

vorian (K 27), *vocian unciam*, is the capital, now Yung-chang in W. Yun-nan.

karaian (K 39), M. Polo II 39: *cayrayam*, and its capital *jaci* (K 38).

gebirg (mountains) *chauran* (J 35), Jom and Ghil: *chabran*.

karaism with *faci* beneath (K 41), far to the north, as well as

chatraia (J 42), with *laci* (J 45) all refer to the same province, subdivided into seven districts or kingdoms, which has been identified with mod. Yun-nan.

chatraia dñf land hot VII. konik Chatraia, this country has VII.
und ist unter den kaiser mango und kings and is under the Emperor
petten all apgotter am (J 42). Mango, and they worship idols.

Below *laci* (J 45) we read:—

hie find vil kripten und heiden di Here are many Christians and
apgettar an petten. heathen who worship idols.

perlen fl. (J 42), Pearl river.

karaian, karazan (K 26), M. Polo II 40, on the coast, mod. Ta-li-fu.

kaindu (K 40), M. Polo II 38, the country of the Kain in Yun-nan.

in diser gegent findt man vil perlein In this region are fished many
die man ficht do fengt man auch pearls; various snakes and worms
allerlei schlangen und gewürm (J 30). are likewise caught.

A second legend, conveying the same information is placed to the S.W.:—

hie in disen feen findt man vil In these lakes are found pearls
perlein di man ficht do fengt man which are fished; various kinds of
mancherlei schlangen und gewürm snakes and worms are likewise
(J 25). caught.

Pearls are fished in a lake near Ning-yuen.

The serpents referred to are shown in miniatures.

The following legend far to the south nevertheless refers to Kaindu:

hie wechft allerlei specerei di man Here grow various spices which
da vernutzet und die keinen unfer landt are consumed locally and none of
gebracht wird (J 11). which are brought to our country.

thebet ein konikreich (K 39), *thebett* (J 34), *thebet das gebirg* (K 35), *gebirg von thebett* (J 31), Tibet, mountains of Tibet.

The following legend, much mutilated, has been restored from a similar legend on Waldseemüller's map of 1507 (M. Polo II 59):—

hie f[indt] man rohr von x [spanne Here are found canes ten spans
di rund u 15] schritt [lang] (J 36). round and fifteen paces long.

Of another legend, placed near a lake called Coromachus on Waldseemüller's map of 1507 (J 27), only the following words are still legible:—

vil long dj . . .

The legend may have referred to the presence of the rhinoceros or unicorn in Mien (mod. Awa), which is not, however, named on the globe (M. Polo II 43). Another legend is of too general a tenour to be allotted to a particular district:—

*hirin find vil städt und wälder von
specerej auch vil konik und mancher
lei landes (J 5).* Here are many towns and woods
of spices, also many kings and
various kinds of land.

The following are the rivers of Chatai and of Mangi:—
*quian daſ wasser, quian fl., quinen (K 45-48), M. Polo II 35, 59, the Yangtsekiang.
brins fl. (K 80), M. Polo II 38: brius, Kin-sha or Upper Yang-tse-kiang.
kirumaru (K 37), M. Polo II 31: caramoran, the Karamuran or Hwang-ho.*

The following names are not mentioned by M. Polo: *india (K 29), indie ptolemäus (K 27), jn hoch india (J 5), and india silva im orient (K 26).*

Hoch india (Indian superior) is a term used vaguely by mediaeval authors. On the Borgia map (1450) it begins beyond the Indus and includes St. Thomas' Land, but the mendicant friar, who wrote about the same time, shifts it far to the east, and makes it to include Mangi.

As to *Indie ptolemäus* I can give no explanation, unless ptolemäus stands for toloman.

Murr, instead of the unintelligible *India silva im Orient* of the original, ventures to emend: *India sive pars Indie extra Gangem.*

mazin, mazin (H 22), which Behaim places to the west of the Ganges, is in reality a contraction of Maha Chin, the "great China," the Macinus or Mangi of N. de Conti, the Mieng of M. Polo, the capital of which was Ava.

birma (K 45).

sandula (K 41), a tributary of the Caramoran or Hwang-ho.

OPHIR AND HAVILAH.

The following legend is placed immediately to the south of the mouths of the Ganges (H 19):—

*jn dem buch genesis findt man das
dislandt dader ganges laufft gehaiffen
ist hevilla da foll da foll wachsen das
best golt in der welt ist jn der heilige
geschrift im 3 buch der konik in den
9 und 10 capitel ist geschriebe das
konik salomon seine schiff hie her
schicket und liejs holen dises goldtes
und küßliche verlein und edelgestein
von ophir gen jernsalem diss landt
gülat und ophir da der stuf ganges
oder das wasser gion durch stent hat
zusamm gehört.*

In the Book of Genesis it is stated that this country through which flows the Ganges is called Havilla. The best gold in the world is said to grow there. In Holy Writ, in the 3rd book of Kings, chapters 9 and 10, it is written, that King Solomon sent his ships hither and had brought from Ophir to Jerusalem of this gold and valuable pearls and precious stones. This country of Gülat and Ophir, through which flows the river Ganges or the water of Gion, belonged together.

In Genesis ii. 11, we are told that the Pison "encompasseth the whole land of Havilah, where there is gold." From the 1st (not the 3rd) Book of Kings we learn that the "navy of Tharshish" came from Ophir once every three years bringing gold and precious stones and other merchandise. Pearls are not mentioned. Havilah or Hevilka is called Evilath, of which the Gulat of the legend is a corruption, in the 'Rudimentum novitiorum.' The Gihon (Gion) is not the Ganges, but the Nile (Gen. ii. 13), "which encompasseth the whole land of Ethiopia." Certain Fathers of the Church have identified Havilah with Ptolemy's Avalita, but I have never heard of Havilah and Ophir being placed in juxtaposition. Colonel C. R. Conder identifies the Gihon with the Araxes, the Pison with the Acampsis of Colchis; he places Havilah in Armenia, and Ophir in Southern Arabia.

ST. THOMAS.

The history of St. Thomas is referred to in several legends to be found upon our globe. This apostle is popularly supposed to have been martyred in India, and upon St. Thomas' Mount, near Madras, the supposed site of his martyrdom, a church has been built by the Portuguese. St. Thomas, however, never wore the crown of the martyr, but died a natural death at Edessa.¹ His supposed missionary activity has caused his name to be introduced into the history of the Three Kings, for he is supposed to have converted one of them, King Gathaspar or Caspar, who has been identified with Gundaphoras, a Parthian ruler at Peshawar.²

Maabar, ein konikreich (I 35). Maabar, a kingdom.
*jn disen konikreich war S. thomas
mit ein pfeil erschoffen.* In this kingdom St. Thomas was
killed with an arrow.

Maabar lies on the S.E. coast of India, and in it is St. Thomé Mount. The information is from Marco Polo, III 27.

calmia (I 20 s), the Calamina of ecclesiastical tradition,³ where St. Thomas was martyred and buried according to Mandeville. This fabulator places it in Maabar (Mabarion), but Behaim has shifted it to northern Coilur.

coilur (I 24 s), the koulam of Ramusio's version (III 25).

*jn diser jnsel coyur ist sant thomas
der zwelf bot gemartert worden.* In this island Coilur St. Thomas
the Apostle was martyred.

Coilur, the Coylü of Pipino's version of Marco Polo (III 31), is identified by Yule with Quillon. Neither Marco Polo nor Mandeville are responsible for the statement that St. Thomas was martyred at that place.

¹ Thilo, 'Acta S. Thomae apostoli,' Leiden, 1823. R. A. Lipsius, 'Die apokryphen Apostelgeschichten,' Leipzig, 1883, I., 223.

² Gutachmid, Rhein, 'Mus. f. Philologie,' 1864.

³ Pseudo Isidor, 'De vita et obitu . . . Sanctorum.' (Monum. S. Patr. orthod., Basilea, 1539, p. 598.)

koulam, das konikreich (I J 8 s), is merely a duplication of Coilur derived from Ramusio's version of Marco Polo.

das lant wird genant egtisilla This country is called Egtisilla.
(I 27 s).

Egtisilla, or Eyriscula, is referred to in John of Hildesheim's version of the "Three Kings" as an island where St. Thomas lies buried.

APOLLONIUS OF TYANA.

Sant jeremias ind vorredt der bibel St. Jerome in the introduction to
daf appolonius bif in dif land gekomē the Bible says that Apollonius
fei (H I 23). came to this country.

Apollonius, if his biographer Philostratus could be believed, was a contemporary of Jesus. St. Jerome is the famous reviser and translator of that version of the Bible known as the "Vulgata."

Fra Mauro (1457) has a legend to the same effect.

THE THREE HOLY KINGS AND PRESTER JOHN.

The three "holy kings" whose bones are exhibited to credulous visitors at Cologne Cathedral and whose memory is revived annually on Twelfth Day, were undoubtedly the "King of Tarshish and the Isles," and the "Kings of Sheba and Saba," of Psalm lxxii. It was not doubted that these "kings" were descended from the three wise men from the East, who, according to Matthew ii. 1-10, were guided by a star to Bethlehem, and there worshipped the new-born "King of the Jews." The Venerable Bede (died 735) already knew that the names of these "kings" were Caspar, Melchior and Balthasar. John of Hildesheim (died 1875) wrote a popular account of their story, which was first printed in German in 1480.¹

Closely connected with the legend of the Three Kings is the reported existence of a powerful Christian Prince—Presbyter or Prester John—in the centre of Asia. This rumour first reached Europe through the Bishop of Gabala in 1145, and it was supposed that this Royal Priest was a direct successor or descendant of the Three Kings. Dr. Oppert has satisfactorily shown that this mysterious personage was Yeliutashe of the Liao Dynasty, which ruled in Northern China from 906 to 1125. Having been expelled by the Koreans, Yeliutashe went forth with part of his horde, and founded the Empire of the Kara Khitai, which at one time extended from the Altai to Lake Aral, and assumed the title of Korkhan. The King George in *Tenduk*, whom Marco Polo describes as a successor of Presbyter John, was actually a relative of

this Yeliutashe who had remained in the original seats of the tribe not far from the Hwang-ho, and of Kuku-kotan, where the Kutakhtu Lama of the Mongols resided when Gerbillon visited the place in 1688.² It was this King George whom Friar John of Montecorvino claims to have converted in 1292.

The Tarshish of the Psalmist must be sought in the East, in maritime India, and not at Tartessus in the West; Sheba was in Southern Arabia, and Saba on the authority of Marco Polo probably in Persia. "Saba Ethiopie," however, in course of time, was transferred to Abyssinia, and its Christian ruler was accepted as the veritable and most popular "Prester John." Friar John of Marignola (1338-53) is the first traveller who mentions an "African archpriest," and on a map of the world which Cardinal Guillaume Filastre presented in 1417 to the library of Reims we read "Ynde Pbr Jo" at the easternmost cape of Africa.³

On Behaim's globe the Three Kings are localised in Inner Asia, on the Indian Ocean and in East Africa (Saba).

daf konikreich tarsis (H 36).

tarsis (H 41), with a picture of a town.

der heiligen drei konik einer aus tarsis genant (H 40). One of the Three Holy Kings of Tarsis, called . . .

with a royal tent surmounted by a flag exhibiting three negro heads.

Far to the north are the Three Kings conversing with a traveller.

Tarsis (Tarssia) is shown on many mediæval maps in a similar position, for instance, on the Catalan map of 1375, where the three kings are shown on horseback about to start for Bethlehem. Haiton is the authority for placing Tarsis in this position.

The following legends refer to one of the kings reigning on the Indian ocean. Opposite the island of Taprobana we read:—

der heiligen drei konik einer auf indio (H 15). One of the Three Holy Kings of India.

Beyond the Sinus magnus of Ptolemy is the following legend:—

hie in difem gebirg ist ein berg genant Vaus auf welchen noch . . . Here in these mountains is a mountain called Vaus, upon which . . .

On this mountain, the Mons victorialis (called Mount Gybeit by John of Marignola) the Three Kings watched for the appearance of the star which, according to Balaam's prophecy (Numbers xxiv. 17), "should come out of Jacob," and which guided them to Bethlehem.

¹ For a reprint see Simrock's 'Deutsche Volksbücher,' IV., Frankfurt, 1846.

² On Presbyter John consult Oppert, 'Der Priester Johannes,' Berlin, 1864, and Zarncke, 'Abhdlgn. d. phil.-hist. Classe d. Sächs Ak. d. W.,' VII., 1879; Uzielli, 'Bull. Soc. Fiorentina, da Soc. Afric. d'Italia,' VIII., 1893.

³ Santarem, *Essai* III., 341.

The third of the Holy Kings is located in East Africa, near the mouth of the Red Sea. Here is a royal tent with the following legend (F 10):—

das konikreich der heilige drei The kingdom of one of the Three
konik einer von saba. Holy Kings, him of Saba.

Below this we read *Saba* (F 4), which clearly stands for Shoa or Shewá, and to the west is a picture of this Prester John of Abassia with a kneeling figure in front of him.

The following legends refer to Presbyter John.

Marco Polo (I 65) is the authority for the first of these legends, which locates the Presbyter in *Tenduk* (J 37), at Thian-te-kiang on the Hwang-ho, to the south-west of Kuku-khotan.

in disen land wohnt der grafmechtig In this country resides the mighty
kaifer genant der meister Johan der Emperor known as Master John,
ein verweiser gestelt ist über das who is appointed governor of the
konikreich di drei heil konik Jaspas three holy kings Caspar, Balthasar
balthasar und melchior in moreland and Melchior in the land of the
und seine nachkomē sind gute kristen Moors. And his descendants are
und vil konik di unter in sind (I 37). good Christians, as are also many
kings who are under them.

og (J 38) to the west and *magog* (J 34) to the south of *Tenduk* are described by Marco Polo as being subject to the Prester. These are the tribes of the Apocalypse (xx. 8), but Polo says that they are known to the natives as Ung and Mongul, that is, the Un-gut, a Turkish tribe, and Mongols.

To the east of *Tenduk* we read:—

das land gegen mitternacht regirt The country towards midnight is
der kaifer mango kann von tataria ruled by the Emperor Mangu, khan
des do ein reicher man ist des grofen of Tartary, who is a wealthy man
keisers meister Johan von indien ist of the great Emperor, the Master
also ist des grofen koniks weib ein John of India; the wife of the great
kristin (J 36). King is likewise a Christian.

Mangu-khan ruled 1251–59. He was a grandson of Chinghiz-khan and Kublai's elder brother. The above information as well as that given in the remaining legends may have been taken from Mandeville (cc. 21, 27), who himself is indebted to Haiton, Friar Odorico and others.

In the Sinus magnus of Ptolemy we read:—

dis mer land und stet gheert als This sea, land and towns all
den grofen kaifer priester johan aus belong to the great Emperor Prester
india (I 15). John of India.

In the southern hemisphere embedded in other legends is the following:—

alles dis landt mör und inseln All this land, sea and islands,
landt und konik sein von de heilige countries and kings were given by the
drey konika gegebē gewest dem kaifer Three Holy Kings to the Emperor
priester Johan und sindt etwan al Presbyter John, and formerly they
criften gewest aber jetaundt wais man were all Christians, but at present
nit von 72 criften die unter jnen sein not even 72 Christians are known
(H 40 s). to be among them.

Mandeville, c. 27, says that 72 provinces and kings were tributaries of Prester John, on the authority of an apocryphal letter supposed to have been sent to Manuel Commenus (1143–80), the Pope and others.

THE ROMANCE OF ALEXANDER.

The legendary history of Alexander the Great has been ascribed (erroneously) to the learned Callisthenes, who wrote a work on the Wars of Alexander, only fragments of which have reached us. The legend originated probably at Alexandria, became popular, was translated into Latin, by Julius Valerius, at the beginning of the fourth century, and other languages. The oldest German versions by Lamprecht der Pfaffe (the Priest) and Rudolf of Ems, are of the twelfth and thirteenth centuries. For a literary history of this legend, see Krumbacher, 'Geschichte d. byzant. Litteratur,' Munich, 1897, p. 849–853.

porta deferi (F 43), only shown by Jom and Ghil, with a flag. The famous "Iron Gates" at Derbend, said to have been erected by Alexander as a defence against the Scythians, and destroyed by Tamerlan (comp. M. Polo I 14).

Alexander altar (F 46), Ptolemy's Alexandri arae, III 5.

bis an dis feile ist der grof As far as this column came
alexander komē und nit ferner gegen Alexander the Great, and not further
mitternacht (F 51). towards midnight.

The column, "Alexandri Columni" of Ptolemy III 5, is shown. Am. Marcellinus, XXII 8, also notices these apocryphal cairns or altars of Alexander.

hie stryft alexander mit darius Here fought Alexander with
(G 29). Darius.

Gaugemela, where the final battle overthrowing Darius was fought in 331 B.C., is in Assyria, and not in Carmania, as shown on the globe.

die paminen [päume von] füte und The trees of the Sun and Moon
mont di mit konik alexander reden which speak with King Alexander.
(H 30).

These are the "Speaking Trees" questioned by Alexander on reaching the Indus. They are inserted as "Oraculum Solis et Lunae" upon St. Jerome's map of Palestine (Miller, "Mappa mundi," III., p. 18) as "Arbores solis et lunae" upon the Beatus map of 776, and upon many later maps.

AFRICA.

PTOLEMAIC NOMENCLATURE.

The following names are taken from Ptolemy's Geography, lib. IV., cc. 6, 7, 8.

libia (D 16) Libya.
getulia (D 20).
duduru (D 19), Dudum.
... mia (D 18) Armiae, now Hermaua, on the old fort, 26° N., 18° E.
dolopes (E 14).
jaramajores (E 5), Garamantes.

golama (E 20), Garama metropolis (IV 6), modern Jerma, a royal tent below with a legend, only four words of which could be deciphered.

difer konik iſt ge . . .

This king is called . . .

badios (E 7) (only shown by Jom and Ghil), Badiath, now Bades near Biskra.

ethiopia ſub egyptia (E 14), Aethiopia intra Aegyptum, now Nubia and the whole of Eastern Africa. Above it a miniature of four travellers.

beretis (F 19), Berethis (IV 7).

ſandern (F 19), Sandace (IV 7).

azewoes (E 9), a mutilated meroes, Meroe (IV 7), now ruins above the confluence of the Atbara with the Nile. A miniature of a fountein above it, which I venture to accept as the "Fons Solis" of Jupiter Ammon (Siwah), already known to Herodotus (IV 181), and referred to by Isidor of Seville as "fons die frigidus nocte calidus."

Cynamoriferi (E 10), Cinnamomifera terra (IV 7), on the Somal coast and not near Ptolemy's apocryphal Nile lakes.

eth . pia (E 11 s), below former, Ethiopia.

azania (F 11 s), the Ajan of the Arabs, the east coast of Somal Land.

elefas monte (F 3), Elephas Mons (IV 7), Ras Fil.

aromata (F 3), Aromata prom. (IV 7), Cape Guardafui. Off it a Portuguese ship.

panovill (F 1), Pano villa or Panumvicius (IV 7), now Bannah, near Ras Hafu.

effica (F 4 s), Essina (IV 7) near Madisha (Magadoxo).

tonic (F 7 s), Tonica (IV 7), now Torre, between Merka (which is Serapion) and Barawa. Nika, in Kiswahibi, means "wilderness."

capta (F 5 s), Rapta metropolis, opposite Zanzibar (at Bagamoxo?).

rapig torcu of Ghillany, rapig torcu and vaptig of Jomard (E 11 s), may stand for raptus flumen, the Kingani Rion.

rapp (E 12 s), a corrupted Raptus. Perhaps identical with Ghillany's nabo.

monomo phagu (F 17 s) (on Jomard's facs. only), Anthropophagi, along the coast to the S. of Rapta.

prafu (F 18 s), Prasm prom., Cape delgado?

lune montes (E F 18 s), Lunae montes, the Mountains of the Moon.

hie in diſen perge lune geheijſſen Here in the mountains Lunae
ſo entſpringt der flus nilus oder ginon rises the River Nile, also called
genani (E 11 s). Gihon.

The Gihon (Gen. ii. 13), one of the rivers of Paradise, was already identified by Eusebius (died 340) with the Nile.

The "Mountains of the Moon" I identify with the snow-clad mountains of Abyssinia.¹

agifimba (F 32 and E 23 s), *agisimba das konikreich* (F 31), Agisymba on the southern border of the Sahara.

¹ See The lake region of Central Africa, 'Scottish Geogr. Mag.', June, 1891.

minupias (F 13 s), Dop and Ghil only, Menuthias, probably Zanzibar island.

marsia (F 1 s), Jom and Ghil marsia, Myrsiaca Insula.

EGYPT.

egipte (E 22), Egypt. To the west a royal tent and the following legend:—

Soldan ein konik des heiligs lands
ein herr über vil konikreich arabia
egypten und damasco (E 28).

The Sultan, a king of the Holy
Land and lord over many kingdoms,
Araby, Egypt and Damascus.

Egypt from 1380 to 1516 was in the hands of the Circassian Mamelukes. In 1517 Sultan Selim I. defeated them to the north of Aleppo, and the country since then, until quite recently, has been misruled by the Osmanli.

At a considerable distance to the west there is a legend which seems to be connected with Egypt:—

hie iſt die ſantig wüſtung do man
mumie findt (E 26).

Here is the sandy desert where
mummy is found.

Fra Mauro ('Zurla,' p. 56) says, "Inquesto luogo che a tra et diserto se recoiè mana," which means the same thing, except that manna is substituted for mummy. The latter, namely the bitumen or aromatic pitch with which the mummies of Egypt were impregnated, was used in Europe medicinally even down to the seventeenth century. Already in the time of Abd al Latif, an Arab physician of the thirteenth century, whose book on Egypt has been translated by S. F. Gunther Wahl (Halle, 1790), the country people brought "mummy" for sale to Cairo, to be used medicinally. The manna of the Israelites (Exodus xvi. 15) is the product of either a tamarisk or a lichen, limited to the Sinai Peninsula.

The only inland towns are:—

elkairo (F 27), Cairo.

enafna (F 24), evidently corrupted, and

siracus (F 21), an evident corruption of a "renovator," perhaps, meant for Siene.

There are no pyramids (Fra Mauro's Piramidi e grenari de Pharaon), no crocodiles, and famous cities like Memphis, and Thebes are ignored.

Along the coast we have:—

tarif (F 30), Tanis.

damiata (F 30), mod. Damietta.

alexandria (E 30), with a flag (3 stripes, blue, red, white; with a flame on central stripe). The winged lion of St. Mark crouches off the port, although Venice no longer enjoyed a monopoly of its trade, superior privileges having been granted to Florence in 1488.

porto vejo (E 30), Porto Vecchio, the "Old Port" of Alexandria.

torre de lorabo (E 30), Terre degli Arabi, the Turris Arabum of Marino Sanuto, mod. Abusir.

porto raraiba (E 30), either the g. deli Arabi (Gulf of the Arabs), or more probably Raiba of A. Benincasa, the latter on Gatta Bay.

BARCA AND TRIPOLI.

falinos (E 31), anct. Selinus, med. Salona, mod. Akbet as Salami.

cazalles (E 31), a small port at or near Kasr Shama.

vezeli (E 31), Isole dei uccelli, now Jeziret et Barda, or Bomba I.

buzeris (E 31) may be a corruption of the anct. Azaris or Axilis to the W. of Ras et Tin.

bonandria (E 32), anct. Apollonia, the Port of Cyrene, med. Bonandria, mod. Suza.

ptolemais (E 32), in Cyrenaica, med. Tolometa.

modebare (E 31).

bayda (E 31), isole de Baida of Andrea Benincasa, now Ghana Island in the Gulf of Sydra.

dibriha (E 30), perhaps Tabith, anct. Boreum.

tofar (E 30), clerical error for Casar (et Atesh?).

casar (E 29), Kasr Ahmet, to the E. of Cape Masrata.

brata (E 30), between this cape and Lebda.

tripolis (E 29) and *tripoli barbarum* (E 30), modern Tripolis of Barbary.

The Sultan sits beneath, in a tent; his flag (red with three crescents and a star) rises on the coast. The legend reads:—

konik vō tripoli barbaria (E 27). The king of Tripoli in Barbary.

lafvechas (E 31), Tripoli vechio of A. Benincasa.

TUNIS.

ptolemais (E 31) is written along Ptolemy's Triton fl. Murr already saw it there.

tunis (twice, on the coast and inland, E 32), Tunis.

kathalia (E 32), Capulia of A. Benincasa, mod. Cape Kapudia.

affrica (E 33), mod. el Mehediah.

comeras (E 33), mod. Kuriat Island.

fiffa, (fiefia, E 33), mod. Suza.

cartago (E 34), Carthage.

bezzert (E 34), mod. Bizerti.

bugia (D 34), Beggia of Leo Africanus, mod. Beja, formerly seat of a bishop, which may account for its flag (a red eagle in gold).

Inland the Sultan's tent (E 30); of a legend by the side of it only two words are visible, viz: *das . . . von . . .* (the . . . of . . .)

BUJA, ORAN AND TLEMCEN.

bona (D 34), Bona.

pora (D 34) should be Stora, E. of the former.

alfol (D 34)?

gegit (D 34), the Gigier of A. Benincasa, now Jijeli.

bogia (D 34), mod. Buja (Bougie), the capital of the ancient kingdom, captured by the Spaniards in 1510. A flag (red with a star and crescent) rises above the town. The Sultan's tent—*konik von bogia*—stands to the S.E. (E 29); a man kneels before the Sultan.

To the south of this tent we read *di santig wiisting* (the sandy desert).

alger (D 34), Algiers.

bones (D 34), an evident error for tenes.

oran (D 34), captured by Spain, 1507. The royal tent (*konik ora*) stands to the south-east.

Due south is the tent of another Sultan described as

konik v. tremefin ein mächtiger King of tremesin (Tlemsen), a
konik (D 29). mighty king.

An ostrich stands beside the tent, a flag (red and gold) rises to the north on the coast, and beneath it, on Doppelmayr's facsimile only, we read *Zara* (Sahara) (D 28).

one (D 34), Onein or Honein.

FEZ AND MOROCCO.

alcadia (D 34), mod. Alcudia.

bona (D 34), an evident corruption. Perhaps the Bedis of A. Benincasa, mod. Velez de la Gomera.

targa (D 35), mod. Targai. Jomard reads Tanga. Neither Ceuta nor Tangier are named, but the Portuguese standard flies at Cape Spartel. The first place on the west coast is

azoner (E 32), Azamor.

niffe (E 31), the Niffe of Pareto (1455) and A. Benincasa (1476), mod. Anafa or Casablanca, and consequently to the north of Azamor. Or are we to assume a clerical error for Saffi, which is S. of Cape Cantin?

castel del mare (E 29), an old castle between Cape Guer and Mesa, rebuilt by João Lopes de Sequeira by order of King Manuel in 1505, to protect the fisheries. It is also known as Agadir or S. Cruz.

agilon (E 29), Aguilon of A. Benincasa, to the N. of Cape Non, now Cape Aglu or Agula.

deferta (E 28), Desert.

cabo baffador (E 27), Cape Bojador.

fetz (D 33), inland with the Sultan's tent.

marock der konik (D 30), the King of Morocco, in his tent.

WEST COAST OF SAHARA.

atlas-montes-daros (D 27), Doppelmayr read "darat," Jomard "dareb." Pliny (V 1) tells us that the Atlas is known to the natives as Dyris. We believe, however, that "claros" should be substituted for "daros," for we learn from the Catalan Map (1375) and from that of A. Benincasa (1476) that the Atlas was known to the Saracens as the "carena" (i.e., the keel) of Barbaria, and to Christians as Montes claros, or bright mountains, on account of the many fires seen there at night, when the Aegipanes and Satyrs held their revels (Pliny V 1), a fable accepted by John of Haldingham, the author of the "Hereford" Map. M. Behaim's own contemporaries, Diogo Gomez and Duarte Pacheco Pereira, know the western extremity of the Atlas as Montes claros. Three

elephants pasture to the south of the Atlas. In former times (Pliny VIII 1) elephants roamed as far N. as the Mediterranean.

THE SAHARA COAST.

tore dorem (D 26), cabo d'area, a synonym for Bojador. *gieso* (D 25).

rio de Oro (D 25), Rio do Ouro, where gold was first received by the Portuguese in 1442. It is the riu de lor which John Ferrer sought to reach in 1346 (Catalan Map) and the "Flumen Palolus (pajola=gold) his colligitur aurum" of Pizzigani (1367).

bon (D 24).

Cabo de barbara (D 23), Cabo das barbas (Valentin Ferdinand) in 22° 20' N.

Sant mathia (D 23).

cabo bianco (D 22), Cabo branco, a white cliff.

castel d'argin (D 21), Castello d'Arguim, with a Portuguese flag, on account of the fort erected there in 1449.

rio de s. Johan (D 21), Rio de S. João (D Gomez), near Cape Mirik.

ponta da tofia (D 20), Punta da tofia (Diogo Gomez), now Cape Mirik.

os medos (D 19), Medoes, i.e., Sandhills.

Sa (sancta) *in Monte* (D 19) should be read Septem Montes. The "VII montes" of the Anglo-Saxon map of the World (tenth century) stand for the "Septem Frates" of Strabo (XVII 6) and Pliny (V 2), that is, the seven lofty mountains rising above Abyla; but the "Regio VII montium" of Pietro Vesconte (1321), and the "Sette monti" of Fra Mauro (1557), are placed far to the south of the Atlas, and the Spanish Friar (1350) actually claims to have crossed this region when he travelled from Cape Bojador to the interior of Africa. They may correspond to the "Sete cabos" of Soligo, to the south of Cape Bojador, where the coast is lofty (terra alta).

anteroli (D 18), mentioned by Cadamosto, Diogo Gomez and others. Perhaps mod. Tanit Bay.

as palmas (D 18), the "Palms" N. of the Senegal (Azurara), N. of Portendik, 18° 19' N. The two palms, once famous, have long since disappeared.

terra de belzom (D 17).

SENEGAMBIA.

cabo de cenega and *Rio de cenega* (D 16), the Senegal.

To the north-east a royal tent and a legend:

konik burburum von Genoa (D 20).

This King is the Bor Byrão of Barros (Dec. I., liv. III., c. 6), a powerful chief of the Jolof, after whose death his half-brother Bemoy came to Portugal, where he was baptised in 1489.

Rio de melli (C 15); the river of Melli is, of course, the Upper Niger, but Melli at one time extended along the Gambia to the sea.

Cabo verde (C 13), Cape Verde.

Rio de Jago (C 12). Its position corresponds to the Rio de Salum, but it may be a clerical error for Rio de lagos, mentioned by V. Ferdinand. North of it we read:—

babacin de gambia (C 12), and inland there stands a royal tent with this legend:

konik barbarin von gambia galof
(D 12).

The people of the Bur ba Sin, or King of the Sin, lived, and still live, to the N. of the Gambia, on the river just named. The Jolof, called Geloffa by Diogo Gomez, Gilof by Cadamosto, lived further north.

Rio di gambia (D 12), Gambia 13° 30' N.

bogabe (D 12), Bugeba, at or near the River Jeba.

de Sagres (D 11), Cabo de Sagres, 9° 30' N.

Rio grande (D 11), of the Portuguese, known to English sailors as the Orango Channel.

Rio de cristal (D 9), just beyond the C. de Sagres, now Maneah river.

Rio de pichel (D 8), Rio de Pichel, enters the sea to the north of the cape mentioned, now known as Pongo, 10° 5' N.

Seralion (D 7), Serra Leôa, 8° 30' N.

The actual order in which the above capes and rivers follow each other, according to Soligo, is thus: Gambia, Casamanza (omitted by Behaim), Cabo roxo (omitted), Rio de Jeba and Bugeba, Rio grande de guinala, Cabo da verga (omitted), Rio de pichel, Cabo de Sagres, Rio de cristal, Serra Leôa.

UPPER GUINEA.

Rio de galinas (D 7), Rio das gallinhas, River of Hens, N. of Cape Mount, still known by that name.

Rio de camboas (D 6), Rio de Camboas, Fishgarth River, a river entering Yawry Bay, 8° 7' N.

Rio de forzi (D 5), Jam and Ghil: forci.

alborero (D 5), arvoreda, a grove of trees.

Rio de palma (D 5), perhaps the Rio das Palmas, to the north, now known as the Shebar entrance of the Sherboro River.

pinias (D 4), perhaps Penedias, rocky places.

terra d'malaget (D 4), Terra de Malagueta.

aus disen land bringt man di grana From this country grains o
paradis in Portugal. Paradise are brought to Portugal.

The "Malagueta Coast" extends from Cabo mesurado to the Cabo das Palmas, but Malagueta is found far beyond these limits.

cabo corô (D 4) may possibly stand for cabo cortes, of Pedro de Cintra (1461), now better known as Cabo mesurado.

angra vqua (D 4) Ghil: angra agua, angra d'agoa, watering-place anchorage? Viqua, according to Pacheco, is a native word for gold.

R. de saint andre (D 4), the Rio de S. André, now known as Sassandra, 5° N., 6° 3' W.

ponta da redis (D 3), not to be discovered along this part of the coast. A cabo das redes, Cape of Nets, is placed by Soligo to the west of Rio da Volta, and can be identified with Barracoe Point.

seria morena (D 3), serra morena, "range of brown hills."

angra de pouaraco (D 4), angra da povoação, village anchorage.

Castel de loro (D 4) is clearly intended for the Castle of S. Jorge da Mina, built 1482 by Azambuja, and the only "castle" in Behaim's days along that coast, although gold may have been obtained elsewhere.

resgate de nave (D 4), i.e., a barter-place for ships, perhaps Axim, where according to Barros there was a "Feitoria de resgate de ouro," a factory for obtaining gold by barter.

olig de S. Martin (D 4) (Jom: cly Smath). No river S. Martin is mentioned elsewhere, and *olig* quite incomprehensible.

bon de nao (D 3)?

Rio de S. johan bapt. (D 3), the Rio de S. João o Baptizante beyond Cabo das tres puntas, where João de Santarem and Pero de Escobar first discovered gold in 1471.

tres pontas (D 3), cabo das tres puntas, Cape Three Points. 4° 44' N., 2° 8' W.

minera quri (D 3), Mina d'ouro, a gold mine, corresponds to the site of the Castle S. Jorge da Mina.

da volem (D 3), Rio da Volta, 50° 47' N., 0° 40' E.

angra tirin (D 3)?

Jomard omits *da volem* and *angra tirin* and inserts instead the incomprehensible names micaca, prometa and virga. They are not given by Murr.

Villa freinte (D 3), Villa franca of Soligo, near the present Porto Seguro, 6° 12' N., 1° 32' E.

terra bara (D 4), perhaps the terra baia of Soligo, "brown land."

Villa longa (D 4), the position of which, according to Soligo, corresponds with Whydah, 6° 20' N., 2° 3' E.

Ripa (D 4), perhaps riba, a hillock, high bank.

monte raso (D 5), "flat mountain," same as Soligo.

rio do lago (D 6), rio da lagôa, our River of Lagos, 6° 37' N., 3° 25' E.

difer flus ist von portugal 1800 This river is 1,800 leagues or
läuge oder meil und stat lisibona sind miles from Portugal and the city of
1200 teuche meil (D 6). Lisbon, which is equal to 1,200
German miles.

The distance, as measured on the globe, via Madeira (see legend) is actually 1,200 Portuguese leagues of 17.5 to a degree, which only equal 1,080 German miles; but following the coast it is only 1,100 leagues. Elsewhere (legend, p. 72) Behaim gives the distance to King Furfur's Land as 1,200 leagues or miles.

Rio de sclavos (D 4), Rio dos escravos, Slave river (Soligo).

Rio de forcada (D 4), Rio dos forcados, thus called because of the "forked tails" of big birds seen by the discoverers, one of which is pictured to the north (Pacheco, 'Esmeraldo,' p. 73).

Rio de Ramos (D 4), Rio dos Ramos (Soligo), "River of the boughs" (of Palm Sunday).

Rio de behemo (D 3), Behaim's River, not mentioned by that name in any other document. It may represent the main branch of the Niger, which enters the sea close to the Cabo formosa where the coast turns to the east.

cauo formoso (D 3), 4° 14' N., 6° 11' E.

The nomenclature to the east of this well-known cape is absolutely original, and cannot be identified with the names given by other explorers, nor can it, owing to the rude design of the globe, be referred to geographical features of our modern maps. They are as follows:—

tiera da peneto (D 3); terra do penedo, "land of the rock."

Rio da Sierra (D 3) might be connected with the serra de Fernão Pó, if it were further to the east.

angra de stefano (D 3), angra de Estevão.

golfo de grano (D 2), G. de grão, grain or corn bay, perhaps Old Calabar.

Rio boncero (D 2), misspelt for bñdetto (Benedetto)?

Beyond this the surface of the globe had been destroyed even when Murr examined it, and covered with blue paint. This accounts, no doubt, from the absence of the Island Fernando Pó, of the Camarons Peak, and of other features perfectly well known in Behaim's time.

BENIN.

The name Benin is not to be found upon the globe, but there is no doubt that the following legend refers to the country stated to have been discovered by d'Aveiro and visited by Behaim himself (see p. 72).

konik furfurs land do der pfeffer King Furfur's land, where grows
wechßt den der konik in Portugal the pepper discovered by the King
gefunden hat año 1485 (E 8). of Portugal in 1485.

A tent with a naked king inside.

I have tried in vain to discover a king or chief named Furfur among the rulers of Benin.

The pepper referred to is the Pimenta de rabo or Piper Clusii.

GUINEA ISLANDS.

de principe (D 5s), Ilha do Principe, with a Portuguese standard.

san thome (D 8s).

Insule martine (D 9s), Martin's Islands.

The ilha formosa or Fernão Pó can no longer be traced on the globe, but I feel sure that it was there originally, and was obliterated by a reckless "renovator."

This must have happened before Murr saw the globe, for he does not give the name of the missing island.

dise inseln wurden gefunden mit den schiffen die der konik aus portugal ausgefickt zu disen porten des mohren landes a 1484 da war eitel wildnus und kein mensch funden wir dar den waldt und vogel da schickt der konik aus portugal nun jährt sein volk dahin das sonst den todt verschuldet hat man und froneem und gibt ihnen damit sie das felt bauen und sich mohren damit dis landt von den portugalesen bewohnt würde.

These islands were found with the ships which the King of Portugal sent out to these parts of the country of the Moors in 1484. There was a perfect wilderness then, and we found no men there, only forests and birds. But at present the king sends there people who have been condemned to death, men as well as women, and he affords them the means of cultivating the land and of multiplying, so that this country may be inhabited by Portuguese.

jtem in diser gegent ist soemer als wir in europa winter haben und alle vogel und thier sind anders gestalt dan die ynfern hie wechzt vil pfeims da man yn portugal neuet algallia (D E 15 s).

In this region it is summer when it is winter with us in Europe, and all birds and animals are different in shape from ours. Much civet (musk) grows here and is called algalia in Portugal (see p. 49).

Val. Ferdinand (*l. c.*, p. 349) confirms Behaim's statement that the gato de algalia or civet cat, was found in S. Thomé.

INNER GUINEA.

genea (D 18), Guinea. It is not impossible that our Guinea, as well as the Guinoia, Guineue or Ganuya of mediæval cartographers may be derived from Gnaui or Gnauya, by which according to Rohlf's¹ the Negroes and their language are known to the Berbers. Azurara (*c.* 60) confirms this hypothesis when he tells us that the Negroes are called Guineus, and that consequently Negroland really began only at the Senegal and not at Cape Non, as believed originally. To the Arabs the land of the Blacks was known as Sudan.

If we accept the above derivation, it is no longer permissible to identify Guinea with the great Empire of Ghana, or with the City of Jenni on the Niger. The following legends go far to confirm this view:—

konik Mormelli bei desse konik wechzt das golt das der konik von portugal laßt holen (D 15).

King Mormelli, where is found the gold which the King of Portugal is having fetched.

bis an dis land sind komen di moren von tunis jertlich mit jr karawan um gold (D 18).

As far as this country the Moors of Tunis come annually with their caravans in search of gold.

A royal tent, with a naked Negro as occupant, stands below.

Behaim's Mormelli represents, no doubt, the ruler of Melli (Mali), a Negro empire which attained the height of its power under Mansa Musa, the Musa ben Abu Bakr of Ibn Batuta (1311-31), but was ultimately broken up by Soni Ali, the King of the Sonrhay (1464-92). It was this Soni Ali who received the embassy despatched by King John, and who permitted the Portuguese to establish a factory at Wadan (1487).

The "Rex Melly" of Dulcert (1339) and the "Mussemelly, lord of the Negroes of Gineua, the wealthiest and most noble lord of all these parts on account of the gold collected within his territory," of the Catalan Chart (1375), was no doubt this great African ruler.

According to Diogo Gomez, Tambucutu (Timbuktu) and Cantor (on the Gambia) were places visited by the Tunisian caravans in search of gold. They were both, at that time, within the boundaries of the Empire of Melli. Benedetto Dei visited Timbuktu in 1470.

konik organ (D 21), with a royal tent.

Both Dulcert (1339) and the author of the Catalan Map (1375) mention a Saracen kingdom of Organa continuously at war with the Saracens of the coast (Tunis) and with the other Arabs. On the Catalan Map (1375) and on that of Fra Mauro (1457) Organa lies far to the east, towards Meroc and Nubia. This is clearly the Organe of João Afonso d'Aveiro (1485), a powerful sovereign living 20 months' journey to the east of Benin, who invested each king of Benin on his accession by the bestowal of a staff, a head-dress and a cross of brass (Barros, Dec. I., liv. III., c. 4).²

I am inclined to agree with Peschel, who ('Geschichte der Erdkunde,' 189) suggests his identity with the ruler of Kanem. Kanem at the time of Dunama ben Tsilim or Selma (1266-1808) extended in the north to Fezzan, and at a subsequent period, under Ali ben Dunama (1465-92) from the Nile in the east to the Niger and the borders of Yoruba in the west.³

On the other hand, it must not be forgotten that Abu Obcid el Bekri (1095) tells us that "Ghana" was the title borne by the ruler of Walata, and that Barth ('Reisen,' IV., 621) states that a like title was claimed by the King of the Mosi.⁴ Of this "Rey dos Moses" King John heard that he was neither a Moor nor a heathen, but that in many respects he conformed to the usages of the Christians. Having previously identified d'Aveiro's Ogane with Prester John, upon receiving this information, this King of the Mosi was taken to be the long sought-for "Prester."⁵

Edrisi (1154), Ibn Said (1274), Abulfeda (1338) and other Arabian authors give accounts both of a land of Ghana in the west, and of Kanem.

konik von . . . (E 2), with a royal tent. Perhaps the Rey de Nubia of Waldseemüller (1507).

On a river flowing to the gulf of Guinea Jomard and Ghillany have the following towns, no longer visible on the original.

louta or *touta*, Jom : locita (E 2).

robig (E 3).

² I have vainly searched the collections in the British Museum and at Berlin for a cross. A curious head-dress (helmet) and a short staff tipped with a bird, are shown on Plates XIV. and XXIX. of Ch. H. Reid and O. M. Dalton's 'Antiquities from the City of Benin,' London, 1898.

³ Barth's 'Reisen,' II., 276; Nachtigal, 'Sahara und Sudan,' II., 380.

⁴ Quatremère, 'Notices et extraits,' XII., 443-668.

⁵ J. de Barros, Dec. I., liv. III., c. 7.

¹ 'Erster Aufenthalt in Marokko,' Bremen, 1873.

SAHARA.

- Ioma Sydgan* (D 19).
fewa (D 14), Giov. Leardo (1448) has Scuro, in Morocco.
foba (D 14).
ahia (D 12).
barca (D 21). There is a Kasr el Barka to the west of Tishit, but Behaim's Barca is evidently meant for the country of that name, on the Mediterranean, Fra Mauro's Barcha.
wagu (D 19).
wurza (E 21), perhaps Walsperger's Veruza on a Lacus affrorum (1448).
lot (E 20).

ABYSSINIA-NUBIA.

Abassia (F 6 s), Abyssinia.

in dieser gegend von afrika regirt der kaiser von abassia oder abissinia sein volk findt erften und treiben große handel mit gold und elfenbein (E 8 s). In these parts of Africa reigns the Emperor of Abassia or Abissinia. His people are Christians and carry on much trade in gold and ivory.

A miniature to the north shows this Emperor or Prester John seated on a chair with a monk kneeling before him.

A blank shield, above the word "*abassia*," shown by Jom and Ghil is not traceable on the original.

abasia-ethiopia (E 22 s), far to the south, a duplication of the name. Jom and Ghil here show a royal tent, which cannot be traced on the original.

saba (F 8), Shoa, has been referred to elsewhere (p. 96).
adem (F 12) is really the true Aden, but has been placed in Africa owing to a misinterpretation of Marco Polo's ambiguous narrative.

The whole of the above information on Abyssinia has been derived from Marco Polo (Pipino's version, III 48, 44).

diner (F 8), Jom and Ghil only.

lidè (F 6). Can this be Aualita?

coniat (F 6) Jom and Ghil: Conia ar.

crancore (F 8), Jom and Ghil: arancore.

Nubia (F 18).

jarude, (F 13) Jom and Ghil: Arade.

salu (F 16), sala.

On the east coast of Africa, just south of the Equator, is an image of St. Matthew seated upon a chair, with the following legend.

diz landt ist bekort von fant This country was converted by
matheus (F 5 s). St. Matthew.

This legend evidently refers to Nadaber (Pliny's Nabata, Ptolemy's Napata), the capital of Queen Candace, above the third cataract of the Nile, at Merawi, where St. Matthew is supposed to have preached (Acta S.S., 21 September). This tradition, however, is rejected in favour of St. Thomas, whom Marco Polo (III 48) credits with having preached and worked miracles, first in Nubia, then in Abyssinia, and finally in Maabar.

LOWER GUINEA.

cabo de las marenas (E 4 s), Jom: c. de S^a Maria.
Serra di san dominico (E 5 s), Jom: Serra de St. roca, possibly the Serra guerreira, "Warrior Mountain," of Soligo, 2° 50' N.

angra do principe (E 5 s), The angra do Principe, Prince's Watering-place of Martellus, at the mouth of the Muni in Corisco Bay, 1° 10' N.

alcazar (E 5 s), according to Murr and Ghil, but no longer traceable on the original.

Rio de furna (E 6 s) Jom: Rio de Tima, the Rio da furna, "river of the Cove." The name very indistinct on the original.

angra de bacco (E 6 s), Angra da barca of Martellus, in Corisco Bay?

terra de estraes (E 7 s), the Cabo das esteiras, Cape of Mats, of Soligo, now corrupted into C. Esterias, 0° 34' N.

Rio de Santa maria (E 8 s), Santa Maria de Nazareth fl. of Soligo and Martellus Germanus—the Ogowé which enters Nazareth Bay, 0° 40' S.

Cabo de Santa Catherina (E 9 s), in 1° 50' S.

Rio de lopo hizali (E 10 s), Ghil: cabo granzale, Murr: cabo gonzale, still Capo de Lopo Gonçalves, named after the mariner who is credited with having been the first to cross the Line, now Cape Lopez, 0° 37' S.

Rio de santa mathia (E 11 s), the S. Mathias of Martellus, identical with the Mexias or Animba River, 1° S.

oraia de Judeo (E 12 s), praia do Judeo, the bay N. of the Fernão Vaz, 1° 30' s.

baja defeira (E 13 s), Bahia deserta?

rio de Sn. andre (E 14 s), perhaps the Fernão Vaz, 1° 40' S.

rio de Catherina (E 14 s), thus on the original, but Murr read Cabo de catherina, which is still known by its original name, and where stood the "tree" of Fernão Gomez, 1° 50' S. (see Soligo's Chart).

fera de sto spir. (E 14 s), Serras do Espirito Santo, still known by that name, 2° 50' S.

praia de jmp. (E 16 s), praia do imperador, the Piagia de lópadore of Martellus, either off the Sette or off the Nyango.

ponta de bairo (E 16 s), Ponta da beira, "coast or shore point."

angra Santa Maria (E 17 s), Murr: angra da fanta marta).

golfo d' sã nicolo (E 19 s), golfo de S. Nicolão (see below, Golfo de Judea).

serra fcoropoa, very indistinct, perhaps Seara caobas or caura, read by Murr *Serra corafo da corte real* (E 19 s), seems to refer to Mount Salombo and the red cliffs "serra corada"—near it, in 4° 20' S. The Corte Reaes were related to Behaim by marriage.

golfo de judea (E 20 s), Jom: Golfo di Indie. This Golfo do Judea, or Jews' Bay of Martellus, is now known

as Kilongo Bay, 4° 12' S., but the "Golfo" as shown on Behaim's globe corresponds to Loango, whilst his Golfo de S. Nicolão best suits Kilongo Bay.

pōta formosa (E 21 s), a cape in Soligo's Praia formosa de S. Domingos, the "beautiful beach," which is undoubtedly Loango Bay, 4° 38' S.

deferta d'arena (E 21 s), *deserta d'arcia*—"sandy desert," is not at all appropriate to this part of the coast. A sandy spit may be meant.

ponta bianco (E 22 s), *Ponta blancha* of Soligo, perhaps Massabe Point, 5° 2' S.

Golfo de san martin (E 22 s) of Martellus' map, now known as Kakongo and Landana bay, 5° 10' S.

ponta formosa (E 23 s), a conspicuous bluff on Landana Bay, 5° 18' S.

golfo das almadias (E 23 s), the "Boat Bay," now Kabenda Bay, also named thus by Juan de la Cosa.

Rio de patron and Rio poderoso (E 25 s).

This Rio poderoso do padrao—mighty river of the Pillar—is the River Congo. A Portuguese standard flies from its northern bank, although the Pillar set up by Cão stood at the south point, in 5° 4' S.

RIVER CONGO TO THE CAPE.

Mue ruodo (E 26 s), the cabo redondo, "round Cape" of Martellus and others, now Margate Head, 6° 31' S.

Rio de madalena (E 28 s), Rio de Magdalena (Soligo), now the Loge, 7° 58' S.

angra et rio de fernande (E 29 s), the Rio de Fernão Vaz of Soligo and Martellus, now known as Dande, 8° 18' S.

ponta de miguel (E 30 s) answers to the Ponta da Espichel of Juan de la Cosa, now known as Morro das Lagostas, 8° 45' S.

ínsula de capre (E 31 s), the Ilhas das Cabras opposite Loanda City, 8° 46' S. Also named by Juan de la Cosa.

cabo delta (E 31 s) (Jom and Ghil abdollo).

ponta alta (E 32 s).

o gracil (E 32 s), the "slim" or "slender."

castel poderoso de san augustin (E 33 s), the castel d'Alter pedroso of Soligo, thus named after a village near Portugalete belonging to the Order of S. Bento, of which Diogo d'Azambuja was commander ('Esmeraldo,' p. 68). Martellus calls it C. de S. Agostinho. I identify this "castle" with the granite cliffs to the South of Ponta choca, 18° 17' S. About ten miles to the south of these cliffs, at Cabo do lobo (Seal cape), also known as Ponta negra or preta, stands the Pillar dedicated to St. Augustine which Cão set up on his first voyage in 1483. This Pillar or Padrao is not shown on the globe.

angra manga (E 34 s).

cabo de lion (E 35 s), cabo do leão.

o rio certo (E 35 s), the c. zorto of Martellus.

terra fragosa (E 36 s), "rugged land," descriptive of the

mountainous nature of the country, is employed also by Martellus.

monte nigro (E 37 s), Monte negro, with a Portuguese standard and the following legend:—

hie wurden gefetat die säulen des konig von portugal a domini 1485 den 18 jan.

Here were set up the columns of the King of Portugal on January 18 of the year of the Lord 1485.

The words "Caput bonae Spei" are given by Jomard and Ghillany, but they are not on the original.

The Monte negro upon which Cão set up his third pillar, in 1485, is now known as Cabo negro, 15° 40' S.

A Magno de Castilho, however, who is of opinion that the globe embodies the results of Dias' voyage, looks upon it as the Cape of Good Hope.¹

BEHAIM'S "FURTHEST" (p. 27).

At *monte nigro* the coast, on the globe, turns abruptly to the east, and along it are inserted the following names:—

cabo ponera (E 49 s).

terra aqua (E 49 s), Jom: tara lapa.

rio de bethlehem (E 40 s), Jom: R. o. Michael.

pouaraszioni (F 40 s), Jom: bona patz; povoação, a village; boa paz, perfect peace.

angra de gatto (F 40 s), Jom: ang. d. galle. Angra do gato, Cat Bay, but angra do gado, Cattle bay.

roca (F 40 s), Jom: tatos; rock. Cantino has a baía da Roca (Algoa bay).

Rio de hatal (F 40 s), Jom: natat, perhaps Rio do Natal, Christmas River.

arenas (F 40 s), areias, sands.

san steffan (F 40 s).

Rio das montes (F 40 s), mountain river. Cantino has a terra dos montes, which may be identified with the Langekloof.

Rio de requiem (F 40 s), Rio do requiem.

cabo ledo (F 40 s), Joyful cape. Dopp: cavo loco.

rio tucunero (F 40 s) (Jom: Rio taquacro, Ghil: oth dauneto).

San bartholomeo viego (F 40 s), Ghil: pont virga. Viga, a beam; virga, a rod.

A Portuguese flag rises from Cabo ledo, and off it lie two Portuguese caravels, with the following legend:—

bis an das ort findt die portugalische schiff kommen und habe jr feul aufgericht und in 19 monaten findt sie wieder in ir land heim kommen.

The Portuguese ships came as far as this place, and set up their column, and in (after) 19 months they again came home to their country.

For the long legend giving an account of the voyage see p. 72.

M. J. Codine's views on Behaim's voyage² have been

¹ Os Padrões, 'Segunda memoria,' Lisbon, 1871, p. 29.

² 'Découverte de la côte d'Afrique' ('Bull. de la Soc. de géographie,' 1876).

referred to elsewhere. According to him the prom. San bartholomeo viego, where, according to Behaim, the Portuguese set up a Padrão, and then returned home, was in the vicinity of Cabo frio 18° 23' S.

TROPICAL SOUTH AFRICA.¹

In the north west:—

wisfe zimatrof (F 5 s). An attempt to translate Ptolemy's 'Cinnamomifera terra'?

jorca (E 5 s), Jom only.

cimaide (E 6 s), Jom: timaide.

delfar (E 8 s), Walds: delsam.

zema (E 9 s), Walds: do.

abja (E 11 s), Walds: abia.

motia (E 12 s), Jom: mathroc, Ghil: metia, Walds (1516): Meta.

Western branch of Nile:—

saraff (E 13 s), Jom: saroff, Walds (1507): saraff lacus. Undoubtedly Lake Tsana.

quariffa (E 8 s), Walds: quarissa. A town Quaritza (Korata) on Lake Tsana?

laguda (L 5 s), Walds: laguia.

On Central branch of Nile:—

fefella (E 9 s), Walds: sessila.

On Eastern Branch:—

hirii (F 15 s), Hiero of Harff and Walds.

fanguio (F 10 s).

zabara (F 7 s), Harff and Walds (1507): the same.

semba (F 4 s), Jom: seneba.

Near the east coast:—

effigea (E 20 s).

pilong (E 19 s), Jom: philang.

gestastra (E 16 s), Ghil: golasta.

taras (E 18 s), Ghil: taro.

tocuma (E 13 s).

gargi/a (E 12 s), Harff and Walds (1507) have the same name.

lipo (E 5 s).

South of the Mountains of the Moon:—

dedul (E 18 s), Walds: dedel.

marmi (E 18 s).

marfi (E 20 s), Ghil: Masi, Jom: Ignette marsi.

tocon (E 22 s), Jom and Ghil: teron, near it two Sciapodes.

adra (E 19 s), Walds the same. Perhaps Adia (Hadiya) in South Abyssinia.

Gafat (D 19 s), Walds (1507): gusat, but (1516): gafat, undoubtedly the country Gafat, south of the White Nile.

reba (F 19 s), Jom and Ghil: veba, Walds (1516): vabi lacus dulcis. It is the Webi in Somaliland.

nichia (F 25 s), Doppelmayer: nibia, Jom: Nubia.

gamma (F 20 s), Harff and Walds the same. A district of that name in Abyssinia.

scena (F 12 s), Jom: suna, Ghil: sena, Walds (1507): socua. This I believe to be a corrupt spelling of Sceva, i.e., Shewa, Shwa, Shoa.

grafeit (F 24 s), Jom and Ghil: grafat; Giov. Leardo's Grasiti to the south of the Empire of Prester John.

Cgrarben (F 25 s), Doppelmayer: giarbo, Jom: cyarbon.

tarch (F 23 s), Ghil: jarch, Jom: jach.

grafe (F 25 s), a duplicate of graseit?

lambin (E 25 s).

tella (E 28 s), Doppelmayer: vella. Tella, a tributary of the Takazzi. Vella, a town on the Red Sea.

oni (E 34 s), Jom only.

lacasto (E 30 s), Murr: lacarto.

norbion (E 30 s).

saffe (F 28 s) Jom only.

blassa (F 34 s) Murr only.

viceon (F 33 s) Murr ricon.

cyro (F 26 s), Cyno[cephali]?

caroneta (F 24 s), Ghil: tarometa.

*hie ist ein fantig verprent land
torride zone genant übel bewont dan
allein an den enden do man wasser
gehaben mag* (E 26 s).

Here is a sandy, burnt-up country called torrid zone, thinly peopled, and only on its borders where water can be had.

*in difem land ist somer als wir in
europa winter haben und jo wir winter
haben so haben si somer* (F 28).

In this country it is summer when it is winter in Europe, and when it is winter with us they have summer.

ZANZIBAR.

Zanzibar insula, zanzibar (G 38 s) with a miniature showing a priest instructing two children.

ezig a town (G 40 s).

*dise infel genant zanzibar hot umb-
fangen 2,000 meil die hott ire aigen
konik und ire befunder sprach und die
inwoer petten abgotter an find grofz
leut gleich wan jr einer hatt vier unfer
man sterc und jr einer tft fo vil als
ander fünf menschen sie gin al naked
und find all schwarz leut fast un-
gestalt mit grofen langen oren weiten
münden grofzschreckliche augen hend
zu viermalen groffer dan ander leut
hendire weifer find auch also grau/am
anzusehen wie die man die volk nert
sich der datellen milch reis und
fleisch kein wein wecht bey in si
machen aber gut tranck von reis und
von zucker grofe kaufman/chafft
geschicht bej in von ambra und von
helfont zenen do findt vil helfant
leeren und leoparden auch gyraffen
und leonzen und vil andere thier di
fast ongeleich unfern thieren findt di
beschreibt marco polo in dritten buch
an dem xij capittel* (H 41 s).

This island, called Zanzibar, has a circumference of 2,000 miles; it has its own king and separate language; the inhabitants worship false gods; they are big men, and they are as strong as four of our men, and eat as much as five of them. They all go naked, and are all black and very much mis-shapen, with big long ears, broad mouths, dreadful eyes, and hands four times bigger than the hands of other men. And their women are as ugly as are their men. These people live on dates, milk, rice, and meat. Their country does not produce wine, but they make a good drink of rice and sugar. There is much trade in ambergris and elephant tusks. Many elephants, lions and leopards are found there, as also giraffes, and dogs, and many other animals, very different from our animals. Marco Polo in the 3rd book and the 41st chapter [Pipino's version] describes all this.

¹ Compare Waldseemüller's Map of South Africa, Map 2.

MADAGASCAR.

Madagascar Jnfula (G 28 s), with the miniature of a priest and a kneeling figure. A large ship with a red and white flag floats to the south-east of it. Marco Polo's Madagascar is identical with Magadoxo (p. 65).

dabona, a town (G 20 s).

ijfair, a town (G 25 s).

die fchiffleutt aus jndia da S. thomas begraben ligt und aufs dem landt moabar genant fahren mit tren fchiffe bis auf dife jnful genant madagascara gewonlich in zwanzig tagen und wen ji wider haim keren in moabar vermogen fy kaum in drey monaten haim zu kommen umb deß moers abfals willen das fo schnelliglich alweg dafelbt gegen mittag warz niderlaufft dife fchreibt marco polo in feinen dritten buch im 39 capitel (G 13 s).

The mariners of India, where St. Thomas lies buried, and of the country Moabar go in their vessels to this island Madagascara, usually in twenty days, but on their return to Moabar they are scarcely able to get home in three months, owing to the current of the sea, which here always runs swiftly to the south. This writes Marco Polo in the 39th chapter of his third book (Pipino's version).

SCOTRA (SOCOTRA).

Scoria (G 7), with a flag.

scoria ist ein jnful gelegen 500 weellich meil von den zweyen jnfuln masculina und feminea jre inwohner findt cristē und haben einen erzbischoff zu einen hern do selbst macht man guet feiden gewandt amba der wechft da vast vil fchreibt marco polo im 38 capitel am dritten buch (G 12).

Scotra is an island 500 Italian miles from the two islands of the men and women. Its inhabitants are Christians, and an archbishop is their Lord. Good silk garments are made there, and much ambergris found, as is written by Marco Polo in the 38th chapter of his third book (Pipino's version).

ISLANDS OF MEN AND WOMEN.

masculina, feminea (G 15), two islands, each with a flag, similar to that of Scotra.

Nach erft gepurt 1285 findt dife zwu jnful bewont gewest in der ain eitel man in der andern eitel frauen weliche eins im jar zufamben komen und findt cristen und haben einen bischoff der ist unter den erzbischoff von der jnful von scoria (G 12).

In the year 1285 after the birth of Christ one of these islands was inhabited by men only, the other by women only, who met once a year. They are Christians, and have a bishop who is under the Archbishop of Scotra.



APPENDIX.

LETTERS AND DOCUMENTS.

I.

MARTIN BEHAIM AN SEINEN OHEIM
LEONHARD BEHAIM IN NÜRNBERG.¹

✠ yhs 1477 adj. 17 april in mechel.
maria ✠

Mein frewntlichen gruff vnd
willigen dienst allezeit lieber vetter
das es dir vnd allen deinem Hauß-
gefindt wol gieng vnd gefundt werit
war mir ein groß frewd von dir zu
horen, lieber vetter als ich dir am
nagten in meinem brieff des datum
stund vmb fasnacht dorin ich dir
schreib wie ich vermaint vnd hofft
itzund in der nagten franckfurter
fastenmes vergangen zu franckfurtt
gewest seyn, das hett ich sicher
gern gethona. Und hett mich
allerding dortzu gericht vnd wert
nit anders ich solt mit mains herrn
sone dargezogen seyn, also kam
pluffluck potich wie es so besorglich
auff dem weg stend so wolt mein
herr nit sein sone mit seinem gutt
wagen darauff verkauft mein her
seine lacken einem teutischen kauff-
mann zu antworff. Also hett ich
meins herren radt mit wem ich
zihen solt, wolt er mir nit ratten
ob ich mit fremden leutten zihen
solt. Also wolt ich aus meiner
aigen verstanten nit wagen auff das
selb bin ich hie zu mechel belieben
darumb bitt ich dich freuntlich das
du mir mein schreiben nit in argk
auff nemeist wan ich gern dort
gewest wer vnd ichs im besten nach
radt meins herrn an hab sten lassen.

Von neuen meren wais ich nit
befunders zu schreiben dan das
ytzunt an suntag nachst vergangen
ist des kaisers inbasaria hier gewest
darin was herzog ludwig den man
nennt den frantzzen hertzog vnd der
bischoff von metz vnd man ist
hoffend des keisers sone mit nanme
Maximilian auf halb may hier sol
seyn vnd mein noifrawen von
burgongne in zu der ee zu haben.²

I.

MARTIN BEHAIM TO HIS UNCLE
LEONHARD BEHAIM IN NUREMBERG.¹

✠ yhs. At Mechlen, April 17,
1477. Maria ✠

My friendly greeting and willing
service at all times: Dear Cousin,
I heard with great pleasure that
thou and all thy household are well
and in good health. Dear Cousin, in
my last letter of shrovetide [Febru-
ary 18], I wrote that I intended and
hoped to have attended the last
lent fair at Frankfurt. I should
certainly have liked to do so, and
had prepared everything, and it
was settled that I should go there
with the son of my master (Herr),
when all at once (pluffluck) we
heard that the roads were not safe.
Therefore my master would not risk
his son or his merchandize, and
sold his cloth to a German merchant
at Antwerp. I then asked my
master's advice as to with whom I
should travel, but he would not
advise me to go with strangers, nor
did I venture to do so on my own
opinion. I therefore remained at
Mechlin and beg thee kindly not
to think ill of this letter, for I
should have liked to go, but thought
best to follow the advice of my
master, and did not do so.

Of news I have nothing special
to report, unless it be that on
Sunday last [April 13], the
Emperor's embassy was here, and
with it Duke Louis, called the
French Duke, and the Bishop of
Metz, and they hope that the
Emperor's son Maximilian will be
here about the middle of May, in
order to marry my lady of
Burgundy³; and everyone is very
glad of this. My lady of Burgundy
has also come to Mechlin and will
remain here. I know of nothing
else to write about except that I

vnd ydermann ist des fere froo.
Auch ist mein frawe von borgogne
hier zu mechel komen die wirt
hier wonen belleiben. Nit anders
wais ich dir zu diesem mal zu
schreiben dan das mir kein brieff
ist von dir worden sider dem des
datum stedt am fontag nach lucie
das was adj. 15 decembrio. Damit
bis gott dem almechtigen bevohlen,
gruis mir dein weib vnd dein swiger
vnd dein hauffgefind. Datum zu
mechel mit eillen geschriben am
heiltnas abett³ anno lxxvij jar ut
supra. MERTEIN BEHEIM.

have received no letter from thee
since the one dated Sunday after
Lucia, or December 15 [1476].
Be therefore commended to God
the Almighty; give greetings to
thy wife, thy father-in-law and thy
household. Written in haste at
Mechlin, on the eve of the Festival
of the Lance and the Nails,³ anno
77 [April 17, 1477], as above.

MERTEIN BEHEIM.

II.

MARTIN BEHAIM AN SEINEN OHEIM
LEONHARD BEHAIM IN NÜRNBERG.⁴

✠ yhs. 1477 adj. 13 otubrio in
mechel. maria ✠

Mein vntterdenighen willighen
dinst alle zeit bereyt lieber vetter
das es dir vnd deiner haustrawen
vnd allen deinen kinder vnd hauß
gefindt wol gieng vnd gefundt werit
hort ich fere gern wifs lieber vetter
ich hoff du habst von meiner lieben
mutter vnd von michel deinem sone
wol vernomen das ich itz in der
nagten vergangen herbstmeß zu
franckfurtt nach meiner mutter
begertten bey partolmes von eib
bin gewesen vnd hab ptolmes von
eib da geholfen vnd hab auch pas
gefehen vnd erlernt was da fur ein
handel fey. Nach dem so bat mich
der von eib widerumb nach endung
der meß gen mechel en meinem
vorigen herrn mit namen Jorius von
dorpp noch den winter getan vmb

II.

MARTIN BEHAIM TO HIS UNCLE
LEONHARD BEHAIM IN NUREMBERG.⁴

✠ yhs. Mechlin, October 13, 1477.
Maria ✠

At all times thy obedient and
willing servant. Dear Cousin, I
heard very gladly that thou, thy
housewife, all thy children and
household are well. I hope thou
hast heard through my dear mother
and thy son Michael that I
attended the last autumn fair at
Frankfurt with Bartholomew von
Eib, as desired by my mother, and
that I assisted there Bart. von Eib,
and saw and learnt how trade is
carried on there. At the close of
the fair von Eib sent me back to
Mechlin, to my old master, Jorius
von Dorpp, with whom I am to
stay next winter, and am to look
further about me. I therefore
started on my way briskly, and by
the grace of God Almighty, I got

¹ Ghillany, Urkunde II. See p. 8.

² The marriage of Maximilian and Mary of Burgundy was celebrated at Ghent on August 20, 1477.

³ This Festival, Festum reliquorum et armorum, is celebrated on the Friday after Low Sunday (the Sunday next after Easter).

⁴ Ghillany, Urkunde V. A facsimile of this letter faces this page.

das ich mich noch pas fol vmb sehen also ist es nun frisch auff dem weg gegangen vnd pin von den genaden des almechtigen gottes wol gen mechel komen Do hoffe ich nach der zusage als mir der von eib den that, ich wer mit gotz hilf diesen winter bis auff die nagten fasten meß beleiben.

Wils lieber veter das mir schier in einem jar kein brief ist von dir worden vnd auch als lang ich aussen bin geveß, so ist mir nert ein brief worden des datum war am suntag nach sant lucia tag anno im 76 vnd ich hab dir sider mir dan pey jii mellen geschriben vnd auff die selben briefe findt mir nit antwort worden also dz mich fere wunder nimpt worumb das du mir so selten oder so winig schreibst, vnd ich pit dich nun in aller lieb vnd freuntshaft das mir ofter schreibst das will auch thun, vnd pin sem auch schuldig zu thonen vnd ich het dir noch gern ofter geschriben fo ich nitschrift von dir het so west ich dir ye nit beunders zu schreiben.

Liber vetter ich pit dich noch gar freuntlichen als ich dir vor auch gethan hab, das du meiner lieben mütter hilflich vnd freuntlich wilst seyn dz selbig ist sie dir auch schuldig zu thone vnd bis ir hilflich in allen iren sachen wan wir ye nit nacher vnd besonderere freunt haben dan dich. wan ich sonder zweifel pin du tußt es wo wir solch der tag eins mit vnsern armen dinft gegen dir verdienen konten oder mochten es were mein geschwistergit oder ich des solt thu on zweifel sein wir wolten sochs thun.

Nit besonders dan das es nit woll itzunt hie in diesem landt stedt des vnfrids halben wan der konig von frankreich hie in diesem landt leib vnd thut fere groffen schaden in flandern vnd in henegaw wan er verhet und vorprendt alles des landt als vil er mag vnd hat itzunt in kurz wol pey 400 dörfen hierwmb abgeprendt vnd vil stedt gewonen, und wen er schon ein stadt sichert leibs und guttes und wen den darin kompt so muß sie alle verdorben seyn, und die man die er findt die moessen am meisten sterben und die frauen und junkfrauen moessen sich schenden lassen also ist die gemein sag und der jung herre von osterreich ligt zu brugk bei seiner schonen frauen und niemant that dem konik kein widerstandt noch nit und der gemain von allen landen müßelt nun fast dorumb und nimant wil zu feld zihen und di herrschaft ist fere arm wan der hertzog von burgund selli-

back to Mechlin. According to what von Eib promised I shall remain there, with God's help, during the winter until next Shrove-tide fair.

Be it known to thee, Dear Cousin, that no letter at all has reached me from thee within last year, and that the only letter which I have received ever since I am away from home is dated Sunday after St. Lucia [Dec. 15] '76. I have written to thee thrice since that time, but have received no reply, and I much wonder why thou writest to me so rarely or so little. I now beg thee, in all love and friendship, to write more frequently, and I will do the same, as in duty bound. I would have written thee more frequently, but as I had no writing from thee, I did not know of anything special to write about.

Dear Cousin, I also beg thee kindly, as I have done before, to give thy help and friendship to my dear mother (she owing the same duty to you), and be helpful to her in all her affairs. As we have no nearer and more especial friend than thyself, I do not doubt that thou wilt do so. If a day should come when my sisters and brothers or myself might give thee our poor services, thou mayest be certain that we shall do so.

There is nought particular to report, unless it be that owing to the hostilities the outlook in this country is not a good one. The King of France is in the field, and does much damage, for he lays waste and burns as much as he can, and quite recently has burnt about 400 villages around here and taken many towns. And although he may have promised protection of life and property the towns which he enters are sacked, most of the men are killed, whilst women and maids are ravished—so it is commonly said. The young lord of Austria [Maximilian] lies at Bruges with his handsome wife, and up till now nobody offers resistance to the King, and the common people of the whole country grumble very much about it, and nobody wishes to take the field, and the government (Herrschaft) is very poor, for the late Duke of Burgundy has taken all the treasure, and it is to be feared that very strange things will happen. May God prevent this [unterstin].

As to me thou needest not be anxious, for the King's army is still quite 16 leagues from Mecheln, and has to take four more towns

ger hat den schatz allen verkrigt und es ist zu beforgen es wer noch fast wunderlich gin, got wols folchs dem unterstin auch bedarfst du mein kein forg haben wan des konigs her ist noch wol xvi meil von mecheln er muss vor wol iiii grof stedt gewinnen ee fy dar mocht komen, und do got vor sey ob solch wurt geschehen so wollt ich mit gotts hilf gleich so pald davon kommen als ein anderer wan ich hab von gotts genaden nit vil zu verliffen. Ytzt nit mer dan grüß mir dein haußfrauen und dein swiger, damit bis got und seiner lieben muter maria bevolchen. Datum am montag vor sent gallen tag anno im lxxvii jare.

MERTIEN BEHEIM
dein vetter zu mechel im
niderlandt.

before it gets here. Should this happen I shall, with God's help, get away as quickly as any other, for, by God's grace, I have not much to leave behind. No more at present! My greetings to thy wife and father-in-law, and be commended to God and his dear mother Mary. Dated, Monday before St. Gall [October 16] anno '77.

MERTIEN BEHEIM,
Thy cousin at Mecheln
in the Netherlands.

III.

MARTIN BEHAIM AN SEINEN OHEIM
LEONHARD BEHAIM IN NÜRNBERG.¹

✠ yhs 1478 adj. 17 Setembrio in
frankfort. maria ✠

Mein vntterdenighen willigen dinft und freuntlichen gruefs zu voran lieber vetter das es dir vnd allen den deinen wol ging und gesundt werft wer mir ein besondere groffe freud von dir zu heren. Wis lieber vetter das mir lang kein brief von dir worden ist find unsers lieben herrn fronleichnamstag und ich hab dir sind geschriben, darauf mir noch kein antwort ist worden, auch hett ich dir gern ofter geschriben also west ich nit besonders dir zu enpitten dann ich pit dich in aller frawntshaft das du mir solchs nit in argk auff nemest. Wiss lieber vetter das der schlusselfelder vnd ander mer bei mir gewesen sindt vnd hab gehort das dein sone Michel wol von gotts genaden gen Wien in osterreich sey kommen vnd dornach zu einem herrn dar komme der mit spezeroy vnd mit andern vmbgee. Also hoff ich zw got ob er selb wil vnd zu greiffen will er werd lernen das in woll nutzen soll. Drumb sich ich fast gern das du in etwas in allend versuchen laßt vnd ich pit dich fleissiglich das du mein schreiben in gut versteht wann ich gann dir vnd allen dein als gut vnd

III.

MARTIN BEHAIM TO HIS UNCLE
LEONHARD BEHAIM IN NÜRNBERG.¹

✠ yhs. Frankfurt, September 17,
1478. Maria ✠

My obedient willing service and friendly greeting beforehand. Dear Cousin, I heard with especial great pleasure that thou and thine are well and in good health. Note that I have received no letter from thee since Corpus Christi day [May 2], and I have written thee since without receiving a reply. I should have liked to write thee oftener, but had nothing to make known, and ask in all friendship not to take this ill. Dear Cousin, be it known to thee that Schlusselfelder and others have visited me, and I learnt that thy son Michael, by God's grace, has gone to Vienna, and is with a master who deals in spices and other things. I hope to God that he will avail himself of this opportunity, and will learn what may be of use to him. I therefore am very glad that thou lettest him try by himself, and I beg thee earnestly to understand that I wish well to thee and thine, and shall be glad at all times to prove my friendship if my poor services can be of use.

Dear Cousin, I beg thee kindly to be helpful to my mother and to advise her in all things, and I

¹ Ohlilany, Urkunde III. Also p. 8.

wo ich dir vnd im mit meinem armen dinft frewntlich mocht thun das welt ich on zwifl allwegen gern thun vnd beweiffen wo ich kan.

Lieber vetter pit dich frewntlich das du der mutter hilffreich vnd redtlich feift in allen dem do fy dein bedarff vnd ich beger das du vnd mein liebe mutter fleifs für kerest das ich etban zu frummen leutten mocht komen in ein handel es ired nit ob ir mich ein iij jar verpfecht vnd ich wolt gern knecht fein vnd alles das thon das im handel zu thon wer nichts ausgenomen damit vnd ich nerit zu eren mocht komen. Mer lieber vetter ich kan dir nit eigtlich wiffen lassen ob mich der partolmes von eib nun lenger zu mechel wirt lassen oder ob er mich in ein ander stadt verdingen werett oder was man mit mir thon wirt, folchs wirt dir der partolmes wol fagen befonders wais ich dir ytz nit zu enpitten dann ob es dir vnd allen den dein wol ging vnd gesunt werft hort ich fast gern. sag meine gruefs deiner hauffraw vnd deiner fwiger vnd deinen kindern vnd allen guten frewten nit anders dann das ich noch von gotts gesaden gefant bin. Datum am freitag von fant matheus tag anno in lxxvliij.

MERTEN BEHEIM
dein Vetter.

IV.

MARTIN BEHEIM AN SEINEN OHEIM
LEONHARD BEHEIM IN NÜRNBERG.¹

✠ yhs. 1479 adj. 8. jugno zu antorff
im markt in niederlandt bei fritz
heberlein von nurebg. maria ✠

Mein vntterdenighen wiligen dinft vnd frewntlichen gruoff zu allen zeitten Bereitt lieber vetter dein wolmogen vnd gefuntheit hortic ich altzeit gern von dir fagen, lieber vetter nach dem vnd ich dir in der nagten fastenmesse zu franckfortt verichrib wie ich von der mutter wegen 300 gulden hat entphangen die mir bartolmess von eib dar auffgericht hat. So wiff lieber vetter daf ich vnd mitt fambt dem gelt wol in das niederlandt komen bin got der almechtig hab lob vnd ich hab mit hilff des almechtigen gottes solchs gelt alles im bergner marck an gute welfe

request that thou and my dear mother may take steps for me to enter a commercial business carried on by honest (fromme) people. It will not matter if you bind me for three years, and I should not mind being a servant (knecht), and to do everything which has to be done in business in order to gain credit, Dear Cousin, I am not yet able to tell you whether Bartholomew von Eib will let me remain longer at Mecheln, or whether he will get me a situation in some other town or what else he will do with me. All this Bartholomew will tell thee himself. I have nothing else to tell thee; I was very glad to hear that thou and thine are well and in good health. Give my greetings to thy wife and thy father-in-law and thy children and to all good friends, saying that, by the grace of God, I am still in good health. Datum, Friday before St. Matthew's day [Sept. 18] '78.

MERTEN BEHEIM,
thy cousin.

IV.

MARTIN BEHEIM TO HIS UNCLE
LEONHARD BEHEIM AT NUREMBERG.¹

✠ yhs. Market Place, Antwerp in the Netherlands, with Fritz Heberlein of Nürnberg, June 8, 1479. Maria ✠

My obedient willing service and friendly greeting at all time.—Dear Cousin, I am always glad to hear of thy wellbeing and good health. Dear Cousin, according to what I wrote thee last Shrovetide fair from Frankfurt, I received then 300 florins on behalf of mother, which were handed to me by Bartholomew von Eib, and, thanks to God Almighty, I returned with that money to the Netherlands, and by the advice and instructions given me by Bartholomew von Eib at Frankfurt, and with the help of Almighty God, I invested all that money in good English white cloth

englische tucher geleggt, nach radt vnd vntterweiffung di mir ptolmes von eib zu franckfortt thett, vnd desse meine tuch sind schon gekarrt vnd geraucht vnd gefchorn vnd ich hoff ein gott wil si sollen noch desse wochen geferbtt wern alf dann so pald sie gehest vnd bereit wern wil ich sie lassen pinden vnd mit ander kauffleutt gutt heim fenden, vnd ich hoff zu gott es soll gutter gewin doran seyn als sie heim kommen wann di tuch fast wol gefallen findtt wann mir haben di werckleut gefagt daff vntter allen tuchen die sie gearbatt haben di andern kauffleutt zu gehort haben di halt mer gekoft haben welche mein maister zu beraitt hot gehabt, haben sie niedert gemeincklich so gute tuch gehabt als di mein findt gott wol daff sie nerit schon geferbtt wern als ich hoff das sie fillen wann ich ger mein allerpeften fleiff damit will thun. Item so hoff ich ein gott wil daff deffer handel fast recht wurd thun wer sach daff ich nerit ymat elters hatt der gefchelschaft mit mir hatt der auch gelt zu mir legett davon ich ler vnd vntterweiffung name, wann einem gefel allein ist kein handirung zu treiben es mosen albeg gewonlich zwey fein der ein der einkauft vnd ein ander der wider vmb hin gibt. Auch angefehen das nun vil tuchs auff engelandt komen findtt, so kann nicht fein sie mosen daff gewandt neher geben ee ein halb jar vergatt, derwail sollen mein tuch verkauft wern ein gott wil so hoff ich es wirdt vnfer sach rechtter thon daff wir dann pelfern gewin wurn haben.

Auch wifs lieber vetter daff mir mein meister zu antorff verguntt hat daff ich kaufmanschaft wol mag treiben nach aller nottorff daff ich bedarff das dartzu gehort, aber ich muiff im di tuch zu bereitten geben vnd in solchen pfennig fur ein andern gonen di weil vnd ich bey im bin als auch gepürlich ist, aber so ich des handels halben nitt zu thun hab so muiff ich teglich an andern tuchen arbeiten als anbereitten heften vnd ramen vnd spannen was in der breff daran zu thon ist gleich als der andern gefellen einer, of findt vnfer nur zwey gefellen vnd haben oft in ein jar zwifchen einer mess vnd der andern wol viij c tuch zu bereitten vnd zu heften allerley tuch als fein englisch, etc. daff lecht 12 kauffleut zu gehorn, darw magst tu der mutter wol zu fagen daff ich nit müffig mag gen funder albeg genug zu thon hab vnd ich kan gott hab lob das

at the fair of Bergen. My cloth has already been teased and raised and cut, and I hope to God it will be dyed this week, and as soon as it is set and finished I shall have it folded and sent home [to a clothier at Nürnberg?] with the goods of other merchants, and hope to God there shall be a large profit, for when the cloth came home it pleased very much. The workmen told me that of all the cloth which my master had to finish for other merchants there was none so good as mine, although theirs had cost more. God please it will be dyed as beautiful as I hope, when I shall devote my utmost industry to it. I also hope, so God please, that this business will turn out right well. The thing would be for me to be associated with somebody older than myself, and one who would put money into the concern, of whom I could learn and take instructions. Commerce cannot be carried on by one fellow (gesel) alone, there should be at least two partners, one to buy and the other to sell. Seeing that much cloth has now come from England its price is sure to go down before the expiration of half a year. Meanwhile, please God, my cloth shall have been sold, and our affair turn out all right so that we may have a better profit.

Also know, dear Cousin, that my master at Antwerp has permitted me to carry on commerce, granting the time needful for the purpose, but I am bound to give him the cloth to finish, thus allowing him to get a penny for a penny, as long as I am with him, which is only fair. But when not engaged in commerce I am obliged to work daily at finishing, setting, tentering and pressing the cloth of others, just like one of the other journeymen. We are only two journeymen, and often, in the course of a year, from one fair to the next, we have to finish and set quite 900 pieces of cloth, including fine English cloth, &c., the property of about a dozen merchants. Thou mayest therefore tell mother that I am not allowed to be idle, and have plenty to do. Praise God I know how to finish all kinds of cloth as needed, for in return for having taught our foreman ciphering he taught me how to finish and press cloth, and everything concerning cloth and the cloth trade. And they all, including my master and the household and the merchants, are, by the grace of God, very fond of me (haben

¹ Ghillany, Urkunde VII., Murr, p. 129. Also p. 8.

bereiten aller tuch noch nottorfft, wann vnser oberster maister knecht hab ich mit der feder leren rechen davor hott er mir als beraiten vnd tuch heften gelehrt vnd alles das zu tuch wol erkenne vnd zu dem handel behorrt, vnd sie al als mein maister vnd als hauffgefint vnd kauffteut haben mich von gots genaden fast lieb, darwv lieber vetter du darfft nitt forgen ich bin nach nottorfft verfehen.

Auch wiff lieber vetter daff mir fast lang kein briff von dir oder von dein son michel ist worden. Ich pitt dich doch laf dich der mite nitt verdriffen vnd schreib mir ofter, daf ich neret mag wissen wie es dir vnd allen den deinen ge wann du waist wol daff einer in fremden landen nitt frolicheres hott dan sehrift vnd freuntlichen grueff von seinen gutten freuntten.

Auch pitt ich dich daff du dir meiner lieben mutter sach vnd auch was mein liebe gewiftergitt angatt entholhen laft sein wo sie deines radtz oft hilf bedurffich wern vnd daff du in troflich vnd freuntlich seist, als ich on zweifel bin du lest sie dir entholhen sein.

Sonderlich waiff ich dir auf difsmal nit zu schreiben dann wo es dir mit sambt deiner hauffraw vnd kindern auch allen deinen hauffge- findt wol ging vnd gefunt werft wer mir ein fonderling groffe freud zu horen. Ich pitt dich auch freuntlich sag mir in allen mein freuntlichen grooffing. Nitt mor dan wo ich dir oder den deinen dinen weft soltu mich zu aller zeit wiliglich finden. hirmitt biff gott dem almechtigen bevolhen, datum zu antorff in brabant am ertag vor unfers lieben froneichnamstag, anno jm LXXIX jar, ut supra.

MERTIN BEHEIM
dein vetter

mich fast lieb). Therefore, dear Cousin, thou needest not fear but that I am provided with all that is needful.

Know likewise, dear Cousin, that it is long since I have received a letter from thee or thy son Michel. I beg you not to mind the trouble and to write more frequently in order that I may know more intimately how thou and all thine are getting on, for thou knowest well that to one in a strange land there is nothing more joyful than letters and friendly greetings from his good friends.

I also pray let the affairs of my dear mother as also what concerns my dear sister and brother be commended to thee whenever they need thy kind advice or help, and that thou be comforting and friendly to them, as I do not doubt thou letest them be commended to you.

I know of nothing particular to write to thee this time. I have heard with particularly great pleasure that thou, together with thy wife and children and entire household are doing well and in health. I pray thee kindly to give to all of them my friendly greeting. Thou shalt at all times find me willing to render a service to thee or thine. Herewith be commended to God Almighty. Datum Antwerp in Brabant on the Tuesday before Corpus Christi day (June 8), Anno 79 ut supra.

MERTIN BEHEIM,
thy cousin.

[Urteilspruch, Samstag, 1 März 1483.]

Item, Merten Beheim ist gestrafft 8 tag und nacht in ein versperzt kernerlin, und Sebalt Deichaler, beides halb auff gnade² und solche straff mit dem leib zu vollbringen, ursach halben, das sie in der nächsten goldfasten mit den juden uff einer hochzeit getantz haben; frist Judica schierst.

Und Hannsen Immhof, H. Freyen und einem zirkelmacher, nachdem sie alleyn zusehen und nit getantz haben, ein strefflich rede zu sagen. Sabbato ante dominicam Oculi (*ibidem*, 1483, H. 2, f. 10^r).

Dem M. Beheim ist sein frist erstreckt bis xiv tag nach seiner widerkunft von Frankfurt (*ibidem*, f. 11^a).³

[Sentence, Saturday, March 1, 1483.]

Item. Martin Beheim and Sebalt Deichaler are each condemned to 8 days' imprisonment, partly as an act of grace,² such punishment to be undergone in their persons, because on Ember-day last they danced with the Jews at a wedding. Reprieved until Judica next [March 16].

But Hans Imhof, H. Frey and a maker of compasses, having been present but not having danced, are to be reprimanded. Saturday before Sunday Oculi [March 1, 1483]. (*Ibidem*, 1483, H. 2, f. 10^r.)

Martin Beheim's reprieve is extended until fourteen days after his return from Frankfurt.³

VI.

GERICHTLICHE URKUNDE⁴ BETREFFEND ZWEI SCHULDBRIEFE AUSGESTELLT VON M. BEHEIM ZU ANTWERPEN, MAY 4, 1484.

Leonhard Hirschvogel der Junger, Auch Nicolaus Schlewitz haben bekannt Nachdem Ine Merten Beheim, Merten Beheims und Fraw Agnesen seiner Eelichen wirtin seligen Sone, yetzo ausser lands wesende, Recht und Redlich schuldig worden sey, solchen halb In zweyen schuldbriefen begriffen, mit seiner handt geschriben. Auch mit seinem bey ennde der geschrift eingedruckten Insigel versigelt, von worte zu worte lawtende, wie hernach folget.

Ich Mertin Beheim, Burger zu Nuremberg, Bekenne offentlich mit diser meiner Handschrift daz Ich Recht und Redlich entfangen habe, von dem Ersamen Weyssen Leonharten Hirschvogel Burger zu Nuremberg, Meinem Lieben Oham ix Seck gallus wegende zu Antorff xxi^o Lib ju Summa die Ich Im zu trewhanden verkaufen sol, und redlich Rechnung davon tun, und Im oder den sein solich gelt aussrichten wille sobald sy verkauft wern, one alles geverdt, und wann Ich ferner In das Landt zeuch, und solich sein gut mitteyln sunder befehl von

VI.

LEGAL DOCUMENTS⁴ CONCERNING TWO BONDS SIGNED BY M. BEHEIM AT ANTWERP, MAY 4, 1484.

Leonhard Hirschvogel, jun., and Nicholas Schlewitz have made a declaration as follows:—

Whereas Martin Beheim, the son of the late Martin Beheim and of Mistress Agnes, his widow, now in foreign parts, has truly become their debtor, as proved by two bonds, written by his hand and appended to which is his seal, the contents of which, word for word, are as follows:—

I, Martin Beheim, a citizen of Nuremberg, declare publicly by this my writing, that I have received from the Hon. Leonhard Hirschvogel, a citizen of Nuremberg and my dear uncle, 9 sacks of gallus weighing 2,100 pounds, which I am faithfully to sell, rendering a truthful account of the results, and paying the money to him or his immediately they were sold, without fail, and when I went further into the land, and his property . . . without his orders, in witness thereof I give him this bond and bind myself that in case God the Almighty should dispose of me, he shall

V.

GERICHTLICHE URKUNDEN ÜBER EINEN TANZ BEI EINER JUDENHOCHZEIT, 1483.¹

[Vorladung, Donnerstag, 27. Februar 1483.]

Item den gefallen, die bei dem judentantz in dieser vasten gewest sein sollen, für rate uff samsttag schieret by dem gelt (7) zu verbotten und alsdann zu hören. (Ratsmanuale, 1483, H. 2, f. 9^r).

V.

LEGAL DOCUMENTS REFERRING TO A DANCE AT A JEW'S WEDDING, 1483.¹

[Summons, Thursday, February 27, 1483.]

Item. The young men said to have been present at a Jew's dance this Lent to be summoned for Saturday next [March 1] to undergo an examination.

¹ Günther, p. 55, from Ratsmanuale, 1483. See p. 9.

² Halb auf gnade, i.e., half the punishment remissible on payment of a fine.
³ The Lent fair at Frankfurt lasted from March 19 to April 9.

⁴ This important document was first published by Dr. S. Günther ('Martin Beheim,' p. 58). I have compared his version with the original at Nuremberg (Litt. V., f. 174). Instead of "andriser," which has puzzled critics, we there read distinctly "andriser guld," i.e., Andreas gulden. See p. 10. I have tried to give a literal translation of this legal document, and hope that, in spite of its uncouth English, the reader may be able to grasp "der langen Rede kurzen Sinn!"

Im, des zu warer urkundt So gebe Ich Im diesen briefe, und verpind mich, ob sach were, das gott der Almechtig ober mich gepewt, das er solich entfangen soll von den die mein gut oder erbaile teilen oder einnemen sollen, oder den Wardt von solchen Newn Secken gallus, oder einundzwanzig zentnen wegende, angesicht diss briefs, und begert das Ich oder die mein als nemen darumb auch quittirt wern so die zalunge gescheen ist, des zu warer urkunde, send ich dem benannten Leonharten diesen briefe unter meinem Sigell geschriben zu Antorff, am nächsten tage des heiligen Creutz tage, Anno LXXXIV.

Ich Mertin Behaim, Burger zu Nuremberg, bekenne öffentlich mit diesem briefe, das ich recht und redlich entfangen hab funfzig anderrisr guld. die mir Hamram Gross im berger Kaltemarkt ausspricht dass Ich Ime dassmals auch ein entfangbriefe gab von wegen des Erasmen Niklas schlewitzers, auch Burger zu Nuremberg, Mer so (be) kenne Ich entfangen haben von demselben Niclas Schlewitzers fünf messen, die wert sein anderthalben florentzen, und 11 gulden ringlen, mer 1 guld pörtlen die er stelt für 1 fl. reinisch Im zu verkaufen zu trewhanden. Item hat er mir verlegt zu Nuremberg an lichten von waschs ein halben gulden, Summa das Ich als schetz auff Achtundfünfzig guld 111 ort. die Ich (be)kenn Innen [im Besitz] zu haben die dem genannten Niklas schlewitzer zugehören und darumb, und Ich jets 1 ferne Landt ziehen werdt So sendt Ich Ime disen brife, zu warer urkundt, und belob [gelobe] Im bey guten trewen solch Summa geltz gütlich auszurichten und zu betzalen, Sobaldt und Ich wider zu Landt komen bin, und ob gott der Almechtige ober mich gepewt das ich mit tode obgieng, So gib ich Im gannzten gewalt solchs zu fordern von den (denen) die mein gut oder erbe erben sollen, mitsampt, ob schadt daraufgieng, nach Pilligkeit, und solich gelt einnemen macht sol haben von meinem erbaile, es sey an ligen den oder faren den oder wie mans heist, das zu warer urkunde gibe Ich Im disen briefe, und begere das er mich quittirt, der geben ist, am nechsten tage, des heiligen Creutz tage, Anno LXXXIV.

das Im Steffan Behaim, des genannten Martins Bruder, auf soliche vorgemalte Ir schuldbriefe, zu gutter Rechnung, underrichtung, oder Rechtverftung seines Bruders,

receive the same from my heirs or assigns, or the value of these nine sacks or twenty-one cwt. of gallus on sight of this bond, and demand that I and mine shall be quits as soon as payment is made, in true testimony whereof I send Leonhard this bond under my seal. Written at Antwerp on the day nearest (before) Holy Cross day in the year '84.

I, Martin Behaim, a citizen of Nuremberg, declare publicly by this bond that I have truly received fifty St. Andrew gulden from Hamram Gross, on behalf of the Hon. Niklas Schlewitzer, also a citizen of Nuremberg, at the "cold" (winter) fair at Bergen and that I gave him, at the time, a receipt. I also acknowledge to have received from the same Niclas Schlewitzer five rosaries, which are worth one florin and a half, and two gold rings, also a piece of gold lace which he values at 1 gulden Rhenish, and which I was faithfully to sell for him. Moreover he has paid for me at Nuremberg for wax-candles half a gulden, or a total of 52 gulden 3 ort, which I acknowledge to be owing to said Niklas Schlewitzer. And as I am now going to a distant country I send him this bond, and promise faithfully to pay him this sum as soon as I shall return to this country, and should God Almighty decree my death I authorise him to demand payment from my heirs or assigns, together with eventual damages, as may be equitable, and they shall have power to claim payment from my portion as heir, in real or personal estate, in testimony whereof I give him this bond, and demand that he acquit me. Given on the day nearest (before) Holy Cross day in the year '84. (May 3, 1484.)

That Stephen Behaim, the brother of said Martin, had honoured and paid said bonds on account of his brother, in the expectation of his returning to this country, in his behalf and the behalf of his brother and sisters and their trustees, namely to Leonhardt Hirschvogel, 110 gulden, and to Niclaus Schlewitzer, 58 gulden, 3 ort, in Rhenish currency, wherefore they had formally, legally, finally and irrevocably freed from further liability the same Martin Behaim, his brother Stephen, and also their brothers and sisters and their trustees, as also their heirs, assigns and descendants, and had likewise promised faithfully on their own behalf and on behalf of their heirs, that in case Martin Behaim

So er zu Lande komen werde, auff geschäft im heissen, sein und seiner geschwistergit vormunde zu gutem dank ausgerichtet und bezahlt haben. Nemlich Leonhardt Hirschvogel, hundert und zehen guldin, und Niclaussen Schlewitzer Achtundfunfzig guldin, drey ortt, alles Reinischer Landsswerung, darumb sy denselben Martin Behem Steffan seinen Bruder, auch die andern Ire geschwistergit und darzu Ihre vormunde, Auch Ir aller erben, erbnemen, und nachkomen, samentlich und sonderlich, In dem allerbesten forme und rechten, gar, und gentzlich, Auch endtlich und unwiderufflich, quitt ledig und lose gesagt, Ine auch darzu für sich und alle Ire erben bey guten trewen, geredt und versprochen haben, Ob Mertin Behaim, so er uber kurz oder lang zu lande komen, wider soliche entrichtung und Betzalunge einrede haben und tun würde, das sy Ine darumb gütlich oder rechtlich, underrichtunge, Rechnunge oder Rechtverftung gestatten, Und umb das, so sy Im dar Innen schuldig und pflichtig werden, one alle Irrunge, oder verziehen, und auch gar und gentzlich one alle seinen schaden, vergnütung und aussrichtung tun tollten und wollen und die vorgeannten Martins geschwistergit und Ire vormunde, Auch alle Ire erben und nachkomen, dess halben gantzschadlose machen und halten. Und alle diweyle solichs wie vorlaut nicht bescheen sey, solle auch dise Bekanntnuss und versprechnuss unvernewt, bey warden [würden] und creften belyben und gehalten werden. Alles als In erclagten und ervolgten Rechten. Testes rogati Wilhelm Hegnin, Mertin Haller und Sebolt von Moren. Actum auff freytage nach Scolastica, Anno MCCCCLXXXIV [13. Februar 1489]

on returning to the country should object to this settlement, they would consent to an amicable or legal examination of accounts, and in case of errors they would indemnify Martin's sisters and brothers their trustees, heirs and descendants. And as long as the above was not done this acknowledgment and promise should remain in force, all this according to the claims made and the judgment given. Testes rogati Wilhelm Hegnin, Mertin Haller, and Sebolt von Moren. Done, Friday after Scholastica, Anno 1489 [February 13, 1489].

VII.

AUSLAGEN FÜR DEN ERDAPFEL.¹

Expenss 1494 a di 26 Augst in Nürenberck Expenss.²

Hernach stett was ich Jorg Holtzschucher ausgehen hab, den apffel oder mapa mundy in die

VII.

EXPENDITURE ON THE GLOBE.¹

Expenditure, Nuremberg, August 26, 1494.²

Below is so be found a statement of what I, George Holzschucher, have expended by order of my lords

¹ Dr. J. Petz ('Mittheilungen d. Vereins f. d. Geschichte der Stadt Nürnberg,' Heft VI., 1896, p. 166) first published this valuable document. It was republished by S. Günther, p. 74. (fl. is a misprint for al. = Silberpfennig.) See p. 82.

² In converting old Nuremberg currency into English money the Gulden Rhenish is assumed to have been worth 10s. This gulden contained 8 Pfund 12 heller; the Pfund (14'84) was worth 80 heller (1'9 farthing).

runden einer kugel gleich, auch umb die getrukten mapa in die kantzley zu machen, mullen und ander uncost, aus welech meiner hern der lossunger; die dan her Merten Beham meinem hern ein erbern ratt zu letze hinter im ver-lassen hatt die kunst und mite seinthalb daran gelegt:—

Item erstlich dem Glockenthon maller von der kugel gegeben zu maln: ist pey 15 wochen daruber ganen, fl. 14, sein weib fl. 1, facitt fl. 15, lb. —, dn. —.

Item zalt von eine leimen patron gein Kalberger zu furn 28 dn, daruber solt man ein grosse kugel gemacht haben; mer umb plahen zu der ersten kugel 21 dn; mer umb wein und pir, prot und anders ausgeben dem maller zu mittag; die weil er am apffel malt, auch zu zeiten dem Peham, und prot, damit man den apfel abrieb und schon macht zu mermalen fl. 1, lb. 1, dn. 16; mer dem Gagenhart zu schreiben von einer schrift 16 dn; facitt allerley uncost fl. 1, lb. 3, dn. 21.

Item so zalt ich dem Glockengisser umb den Furn. den Kalberger zerbrochen hatt, solt Kalberger ein grosse kugel daruber gemacht haben, wede ding durch N. Grossen und M. Peham; dt. im fl. 2., lb. —, dn. —.

Item so zalt ich umb ein weissen parchat der umb die kugel gemacht ist, 80 dn.; mer umb ein lideras futter über die kugel, dar durch sie nicht westib, kost 3 lb. 20 dn.; mer zalt ich dem schlosser umb die zwen eiseren reif, darina die kugel umbget, 4 lb., 6 dn.; mer dem schreiner umb den hülzen fus, darauf die kugel stett, 4 lb., 6 dn.; facitt allerley ausgeben fl. 1, lb. 6, dn. 10.

Item so zalt ich her Merten Beham umb ein gedrukte mapa mundi, da die ganzte welt ins wegriffen Ist, die da wol dint zu dem apffel und in die kantzley gehent wirt, kost 1 fl. 3 lb.; mer kost sie zu malen 1 fl.; mer zu füttern und leima, 5 lb. 10 dn.; mer dem schreiner in ram und zwue taffel gemacht 1 fl.; mer dem Starch maller von disen hulzen tafeln zu malen 4 lb. 6 dn.; facit fl. 4, lb. 4, dn. 6.¹

Item so ist dem Kalberger das machon von der kugel nit bezalt,

of the city treasury, upon limning and otherwise, for making the "apple," or mappa mundi in the shape of a sphere, and also for making the printed map for the clerk's office, which Mr. Merten Beham, having expended thereon his art and pains, left behind for the enjoyment of my lords of the worshipful council:—

Item first, to Glockenthon, who painted the sphere, and spent 15 weeks over it, fl. 14; to his wife fl. 1, facit, fl. 15, lb. —, dn. — (£2 10s.)

Item paid for a loam mould over which the sphere was to have been made, as a guide for Kalberger, 28 dn.; also for linen for the first sphere, 21 dn.; also for wine and beer, and other things, for the limner's dinner whilst painting the globe, and occasionally also for Peham; and for bread for cleansing the globe and making it nice, fl. 1, lb. 1, dn. 16; also to Gagenhart for lettering, 16 dn.; facit, miscellaneous expenses fl. 1, lb. 3, dn. 21 (14s. 5d.)

Item paid Glockengisser for a mould broken by Kalberger, and round which Kalberger was to have made a large sphere, both through N. Gross and M. Peham fl. 2, lb. —, dn. — (£1)

Item paid for white vellum (parchment) covering the sphere, 80 dn.; also for a cover lined with skin to protect the sphere from dust, 3 lb. 20 dn.; also to the smith for two iron hoops within which the sphere revolves, 4 lb. 6 dn.; also to the joiner for the wooden stand of the sphere, 4 lb. 6 dn. facit, miscellaneous expenses fl. 1, lb. 6, dn. 10 (17s. 7d.)

Item paid to Mr. Merten Beham for a printed mappa mundi, embracing the whole world, which was used for the globe and is to be hung in the town office, 1 fl. 3 lb.; also for painting, etc., 1 fl.; also for lining and glueing (mounting) the same, 5 lb. 10 dn.; also to the joiner for a frame and two panels, 1 fl.; also to the starch painter for painting these panels, 4 lb. 6 dn.; facit fl. 4, lb. 4, dn. 6 (£2 5s.)¹

Item. Kalberger has not been paid for making the sphere; he demands 3 fl., but owes for the linen which was used for the old tent over the "beautiful fountain,"

fodert 3 fl., dargegen ist er schuldig die plahen von dem alten zelt über den schon prunen geprauchet ward; solt er die gros kugel ausgemacht haben; auch so hatt er den patron oder furn zerbrochen, da man dem Glockengisser 2 fl. umb must geben; auch sagt er her Merten zu, er solt in die kunst kosmograpia lerne oder das aussteiln der kugel, so wolt er dieweil ander kugel machen.

in return for which he was to have made the large sphere; he had also broken the pattern or mould for which 2 guilden (20s.) had to be paid to Glockengisser; he also promised Mr. Merten that if he taught him the art cosmography or the laying out (planning) of the globe he would make another sphere during the time.

VIII.

DR. HERMANN SCHEDEL'S REMARKS ON BEHAM'S GLOBE.²

De globo sperico terre.

[Mundi formam omnes fere consensient rotundum esse, idemque de terra sentiunt, que in media rerum constituta gravia queque ad se trahit aquis maiori ex parte submersa.]

[Sunt qui arbitrantur quatuor eius plagas apparere, quas magnus insecat oceanus, duobus amplissimis fluminibus eas ambiens quorum alterum zodiaci subiciatur alterum ab aurora dextra levaque per polos defluens extra columnas Herculeas coniungatur atque in hunc modum totius terre quatuor porciones velut ingentes insulas emergere. Que celo subiecte benigno mortalium habitaciones admittant.]

Hunc orbis situm impeditum opus in hoc sperico globo ornatissimo facundie minime capax verum aspicit cognoscique dignissimum M. B. eques auratus anno Christi 1492 absolvit pro gloria inclite urbis Nurembergensis et cum [nec divinis operibus maledica lingua pareit, quecumque enim mortales agunt sive privatim sive publice calumnias subiacent, haud diffidimus, quin nostrum laborem malignus interpres non fugiet, neque maledicis occursuri clausurique ora contendimus. Frustra nitimur et in dextro et sinistro latrant itinere canes.]

[Nullis enim vita sine reprehensione currenit. Communem igitur sortem equo animo ferre decet,] presertim [precipue] cum opus ex illustribus cosmographis ac geographis tum antiquis ut Strabone, Pomponio Mella, Diodoro Siculo, Herodoto, Plinio secundo Novocomensi, Dionysio etc tum modernis ut Paulo Veneto, Petro de Eliaco et peritissimis viris regis Portugalis proficimus.

[De situ locorum, que videbantur necessaria, inseruimus et quantum terrarum orbis incolitur, cum interiectis et circumfusus aquis.]

[At quodcumque de nobis iudicium fuerit non inviti subibimus, quando in hoc opere neque optimorum speramus laudem neque pessimorum timemus vituperium, neque qui nobis detraxerit, id glorie assequetur, ut omnes ei consensiant et fortasse futura etas id approbabit quod nostra reiecerit.]

Hic globus labore et opera M. B. absolutus est, in quo orbis situs strictim continetur, quo pacto se habeat forma totius orbis maximeque eius partes, Europa scilicet, Asia et Affrica, quomodoque singulo eius partes se habeant.

Similiter ore et littora, qualiter se intra et extra ostendant, qualiterque pelagus ea subeat et circumdet.

Absolute etiam sunt latitudines et longitudines paralellorum ex veteribus cosmographis ut Ptolemeo, Strabone, Diodoro Siculo, Plinio; similiter ex recentioribus ut Petro de Eliaco, Marco Polo Veneto, aliisque cosmographis martiribus eaque omnia doctis dumtaxat, in quibus, si erraverit, correccioni se submittit, sciens, nihil esse cui non possit additamentum ad operis consumacionem fieri, etc.

¹ G. Holzschuher seems here to have made a slight error in casting up. Assuming the proportions adopted by me, the total only amounts to 4 fl. 4 lb. 4 dn. (instead of 4 fl. 4 lb. 6 dn.). Holzschuher (Petz, i. 168) gives the total cost of globe and map at 24 guilden 5 lb. novo 9 al. 2 heller; my addition makes it 24 fl. 5 lb. 23 dn., a trifling difference of 3 heller, or 1½d. The Pfund novo was reckoned at 120 Silberpfennig at 2 heller each.

² These remarks on Beham's globe, in the handwriting of Dr. Hartmann Schedel, were discovered by Dr. Richard Stauber on the fly-leaf of a book now in the Munich library (4^o, Inc. o. s. 97 fol. 104). Dr. H. Grauert discovered that quite one-half of the text was borrowed from the *Asia* of Pope Pius II., published in Venice in 1477; the passages thus borrowed are placed above within square brackets. See R. Stauber, 'Die Schedelsche Bibliothek' (Freiburg, 1908, pp. 61, 297). See p. 69.

IX.

LETTER OF DR. H. MONETARIUS TO KING JOHN OF PORTUGAL,
JULY 14, 1493.¹

To the most serene and invincible John, King of Portugal, the Algarves and maritime Mauritania, the first discoverer of the Fortunate Islands, the Canaries, of Madeira and of the Azores, Hieronymus Monetarius, a doctor of medicine in Germany, most humbly commends himself.

As you have laudably imitated the most serene Infant Dom Henry, your uncle, in sparing neither efforts nor expense to make known the circuit of the world, as you have made tributary the Sea of Ethiopia and Guinea and the coast-peoples as far as the tropic of Capricorn, with the commercial products thereof, such as gold, grains of paradise, pepper, slaves and other things, and as by these endeavours you have won not only praise, immortality and glory, together with great profits, it cannot be doubted that, within a short time, the Ethiopians, who resemble animals in the shape of men, and are strangers to divine worship, will, through your efforts, throw off their bestiality, and embrace the Catholic religion.

Maximilian, the invincible King of the Romans, who, through his mother, is himself a Portuguese, intended to invite Your Majesty through my simple letter to search for the eastern coast of the very rich Cathay.

As Aristotle admits at the end of Book II. *De Coelo et Mundo*, as do also Seneca, Book V. of *Naturalium Questionum*, and Petrus de Alyaco, the most learned cardinal of his day, as also many other enlightened men, I maintain that the inhabitable East is very near the inhabitable West. This is proved by the numerous elephants found in both, and by the bamboo canes which are driven by storms from the eastern shores to the shores of the Azore Islands.

Numberless arguments demonstrate unquestionably that by sailing across this sea Eastern Cathay can be reached in a few days. No notice should be taken of Alfraganus or of other persons of no experience, who asserted that only one-fourth of the earth was above the sea and the other three-fourths were under the sea, for in matters referring to the habitable earth, we should believe experience and trustworthy accounts rather than fantastical opinions.²

You are aware, no doubt, that many astronomers of repute have denied that habitable land was to be found between the tropics, yet your own experience has shown that this was an erroneous and false assumption. It cannot be doubted that the earth (land) is not spread out below the water (sea), but that, on the contrary, the sea is immersed. Moreover, there is the sphericity of the earth.

You possess means and ample wealth; as also able mariners, eager to acquire immortality and fame. What would not be your glory if you succeeded in making known the habitable East to your West? And what profit would not be yielded by commerce, for you would make these eastern islands tributary, and how often would not amazed kings of these islands quietly submit to your dominion?

Already your praises as a great prince are sung by Germans, Italians, Ruthenians, Poles, Scythians and those who dwell under the dry star of the Arctic Pole, jointly with those of the Grand Duke of Muscovy, who a few years since found under that star the great island of Greenland, the coast of which extends for 300 leagues, and upon which there is a numerous colony of subjects of said Grand Duke.³

If you carry out this expedition you will be praised as a god or as another Hercules. At your pleasure you may secure for this voyage a companion sent by our King Maximilian, namely, D. Martin Behaim, and

many other expert mariners, who would start from the Azore Islands, and boldly cross the sea, with their cylinder, the quadrant, astrolabe and other instruments. They would suffer neither from cold nor heat, for sailing to the eastern coast they would find the air temperate and the sea smooth.

Many are the grounds upon which Your Majesty is respected. Let the profit spur on him who runs. You, however, examine thoroughly everything to the uttermost, and therefore to write at length about them would hinder him who already runs from reaching the goal. May the Almighty keep you in this design, and when your knights have crossed the sea, may you be glorified with immortality.

Vale! From Nuremberg, a city of Upper Germany, July 14, A.D. 1493.

X.

MARTIN BEHAIM AN SEINEN VETTER
MICHAEL BEHAIM, SEN. (SOHN
DES LEONHARD BEHAIM UND
SENIOR FAMILIAR).⁴

YHus. 1494 adj. 11 Martzo jn
Brabant bej . . .⁵

Mein frewtlichen gruff vnnd
willigen dinft mit sambt allem
guten das Ich vermag Lieber Vet-
ter das es dir mit sambt der deine
vnnd meine gewifsergten wol ging
vnnd gefunt wert das wer mir ein
funderling Frewdt zu hörn, Lieber
Vetter Ich main Euch allen fey wol
wiffent das Ich in dem Jar vergan-
gen wol got hab def Lob mit Leib
vnnd allem meinen Gutt vber mer
kommen bin Jn portogal vnnd Jn
uns Landt zu meinen lieben Herrn
Schweher vnnd allen den vnfern
welche bej der Gracien gottes Ich
allen Jn guten Püntten funden hab.
Nun Jn defen Jar bin Ich wider-
omme vom Konig hier in Flandern
zum Konigs fun⁶ hiergeschicht worden
Jn Welcher reif auff dem mer Ich
gefangen wurd vnnd in engelandt
gefuret mit sambt mein dinern
allem Zergelt das lecht 160 gulden
wart behalten bej ij monadt omme
des Jungen Konigs von engelandt
der yzt bei dem romfchen Konig⁷
ift omme das man Jn hier hauff
und hoft etc. Jn welcher Zeit ich
febres vercregh vnd zwir dj Kertz
Jn der hant het omme zu sterben
etc. vnnd nach dem Ich frifch wurd
het mich ein merauber heimlichen
allein int Jn francheich auff ein
nacht Jn feinem schiff weck gefurt
Ich wer gefechacht worden vmb vil

X.

MARTIN BEHAIM TO HIS COUSIN
MICHAEL BEHAIM, SEN. (SON OF
LEONHARD BEHAIM, AND HEAD
OF THE FAMILY).⁴

JHus. 1494, March 11, in
Brabant, with . . .⁵

My friendly greeting and willing
service with all the good in my
power!
Dear Cousin, I was especially
pleased to hear that thou and thine,
as also my sisters and brothers, are
well and in health. Dear Cousin,
I think you all know that last year,
praised be the Lord, I crossed the
sea with all my belongings to Por-
tugal and our country, and my dear
father-in-law and all of ours whom,
by God's grace, I found well in all
respects. In this year the King
again sent me into Flanders to the
King's son.⁶ In crossing the sea
I was captured and taken into
England, together with my servants
and all the money I had to pay
my expenses, amounting to quite
160 gulden. I was detained for
about three months on account of
the young King of England,⁷ who
is at present with the King of the
Romans,⁸ so that he may live and
keep his court here, etc. During
that time I caught a fever, and
twice I had a lighted taper in my
hand, expecting to die, etc. When
I was well again, a pirate one night
carried me secretly in his ship to
France. I was much damaged in
property, but, praise be to God, I
got away at small expense. The
fever, through the mercy of the

¹ A translation of this letter into Portuguese by Alvaro da Torre, the King's chaplain, was first printed as an appendix to Sacrobosco's *Tractado da Spera do mundo*, Lisbon (G. Galhard, n.d.) and reprinted in Ernesto de Canto's *Archiva dos Agores*, pp. 444-7. H. Harrisse, *The Discovery of North America*, 1892, p. 895, gives an English translation. A copy of a portion of the original Latin text, by H. Schödel, has recently been discovered in Munich (see Dr. H. Grauert, *Hist. Jahrbuch der Görres Ges.*, xlix. 1908, 315-19).

² As a matter of fact 29 per cent. of the surface of the globe is land, 72 per cent. water.

³ Iwan III, who died in 1505, made large territorial conquests, but never approached Greenland. This may refer to a voyage of Szkolny, of Köln, who, in 1476, by order of Christian II. of Denmark, is reported to have visited Greenland. (Gomara, *Hist. de las Indias*, c. 87.)

⁴ First published by Murr, p. 132. See p. 43.

⁵ Perhaps, mit Velj, at Antwerp.

⁶ The Archduke Philip, son of Maximilian.

⁷ The impostor Perkin Warbeck.

⁸ Maximilian I., Römischer König.

gutes aber got hat lob Jch bin wol ontgangen mit cleiner Kostung vnd febrhes haben mich von den genaden des almechtigen sohr verlossen vnd vermain ob got will zwischen oftern vnd pfingsten wider heim so paldt vnser Zucker von meinen her swecher hir bezalt wirt etc. Furpas meiner geschwisterg halben zweifelt mir nit du kereft alding zum allerpfen vnd halt, si sein dir gefolig vnd es wer gegen dir vnd deinen der tag eins erkant Jnallen gutten¹ Jch bit dich zu lassen gruffen di zwo swecher Jn clostern auch all mein geschwisterg und schwager. Jch hab noch nit schrift von Jn gehabt doromb weest ich auff dj Zeit kein antwort bis auff den negften potten. Deinem Weib mutter vnd allen deinen kindern wunsch Jch Hail vnd geluckelikeit vnd vns allen, datum am dinstag nach Letare Jherusalem anno 1494.

Ob mir ymat ycht wolt schreiben dermag dj briff bestellen des Konigks von portogals factor hic zu antwerp oder hir zu brig der fol mir sie Jn vns lant wol bestellen vnd die vberschrift der brief an mich miffen Jn latein sein also Dno. Martino Boheimo Militi, In Vltibona alemano, regni portogalie, genero capitani Infularum azores faial et pico et Infularum flemengorum, vbi vbi fit etc.² so werden sie mir geantwurt bej dem factor alle monat van der factor wondt neben der Velj hauf zu antorff. Also durch der Velj diner zu antorff mogen mir Eur briff wol befeilt worden ob mir ymat Jcht schreiben wurd. hermit so sej der almechtig got mit Euch allen.

MERTIN BEHEIM,
zu deinen Dinst alzeit berejt.

Item.

Lieber Vetter. Nach datum diffes briefs so muot Jch Eylantts gen portugal also das mir differ belib Vnd Jch Jn mit mir wegw furt, also pin Jch anderwerff Jn portugal wol kommen got lob zu meinem schwache vnd bis auff pfingsten [18. Mai] wert Jch do bleiben wilt Gott.

Almighty, has quite left me, and, God willing, I hope to start for home between Easter and Whitsuntide,¹ as soon as my father-in-law's sugar shall have been paid for, etc. Further, as to my sisters and brothers, I do not doubt, thou dost the best in all things, that they obey thee, and this will be recognised one day.² I pray you to give greetings to my two sisters in the convent, also to all my brothers and sisters (Geschwister)³ and to my brother-in-law. I have had no letter from them, and therefore defer a reply until the departure of the next messenger. I wish all blessings and happiness to thy wife, thy mother and all thy children, and to all of ours. Dated on the Tuesday after Laetare Jerusalem, in the year 1494.⁴ [March 11, 1494.]

If any of you desire to write to me now let them address the letter to the factor of the King of Portugal, here at Antwerp, or here at Brugge, who will forward it, and the superscription should be in Latin, thus: Dno. Martino Boheimo Militi, in Ulisbona alemano, regni Portogalie, genero capitani Infularum azores faial et pico et Infularum flemengorum vbi vbi fit, etc.⁵ and the factor will then forward them every month. The factor lives in the house next to that of the Velj at Antwerp. The servants of the Velj at Antwerp will forward your letters if any of you write to me. God the Almighty be with you all!

MERTIN BEHEIM,
at all times at thy service.

Item.

Dear Cousin, after the date of this letter I was obliged to hasten back to Portugal, and this letter remaining in my hands, I took it away with me. Thus I came once more to Portugal, praise God, and joined my father-in-law, and shall remain here until Whitsuntide [May 18]. Doctor Jeronimus⁶ will tell you all how things are with me. Give greetings to all

Doctor Jeronimus' wirt euch allen wol sagen wie das Es mit mir Stedt grufft mir alle geschwisterg. Sag Vlrich Futterer Jch bit Jn das er mir schreib gen Jenua von dar wirt man mir gen Vlixboa dj briff Jn di ilha de maderia wol bestellen vnd also forrt Jn dj ilhas dos azores vnd grufft mir Jn fleissig vnd laft mich wissen an wen Jch zu Jenua sol schreiben das dem futterer mein briff mogen weren Vnd Jn welche gaffe vnd wie der mann haift, hiemit sei got mit Euch allen. Amen. Dem erbrigen vnd weissen Michel Beheim Seniori meinem lieben Vetern Zu Nurnberg an der Zistelfaffe.

sisters and brothers. Tell Ulrich Futterer to write to me to (via) Genoa, whence my letters will be forwarded by way of Lisbon to the Ilha de Madeira and so on to the Ilhas dos Azores, and greet him warmly, and let me know to whom I am to write at Genoa in order that my letters may reach him, and to what street and what is the man's name. Herewith be God with you all. Amen.

To the hon. and sapient Michel Beheim, sen., my dear cousin, at Nuremberg, in Zistel Street (now 4 Dürer Street).

XI.

VALENTIN FERDINAND'S ACCOUNT OF FAYAL AND PICO.⁸

YLHA DO FAYAL E PICO.

THE ISLAND FAYAL AND PICO.

Jost de Utre fidalgo⁹ da casa del duque de Borgonha que foy casado com a Irmã da Imperatriz¹⁰. 6. annos depois¹¹ de arzila tomado por palaura de frey Pedro¹² da ordem de Sam Francisco homem letrado e confessor da raynha de Portugal em chegando a frandes por embaixador para a duqueza ouve falla com Jost Utre ho qual tinha tres irmãos ricos¹³ e elle como homo mancobo seguindo a corte guastava sua fazenda mais que os outros ao qual ouve falla este Frey Pedro de como se acharom as sylbas em tal rota e que avia nellas muyto prata e stanho etc. pello qual moveo ao dito Jost de Utre ouve sua fala em bruges donde era com 16. homens traballadores, homens de bem dando lhe mesmo a entender de como lhes faria ricos ata que virom ter a Portugal onde o dito Utre ouve

Jost de Utre, a nobleman⁹ in the household of the Duke of Burgundy, who had married the sister of the Empress,¹⁰ six years before the capture of Arzila,¹¹ had speech of Friar Pedro¹² of the Order of St. Francis, a man of culture and confessor of the Queen of Portugal, who had come to Flanders as an ambassador to the Duchess. Jost Utre had three wealthy brothers,¹³ but himself, having followed the Court as a youngster, had spent his fortune more freely than they had. Friar Pedro, now the islands had been discovered, in what direction they lay and that they abounded in silver and tin, &c., which animated said Jost de Utre. At Brugge, whence he was, he spoke with 16 workmen, good men and true, giving them to understand that he would make them rich, upon which they went

¹ Hieronymus Monestarius or Mintzer kam Ende November 1494 nach Lissabon, und reiste schon am 2. December von dort ab.

² Copied from a loose leaf of Valentin Ferdinand's MS. at Munich (Cod. hisp. 27), and first published by P. J. Baudet, 'Beschrijving van de Azorische Eilanden,' Antwerp, 1879, pp. 69, 201.

³ Frei Diogo das Chagas calls him an equerry (Panadeiro) of the Duchess Isabella of Burgundy.

⁴ D. Isabel, Duchess of Burgundy, was a daughter of King John I., and consequently an aunt and not a sister of D. Leonor, daughter of King Duarte, who had married Frederick III., the German Emperor, in 1461. Duke Philip, the husband of D. Isabel, died in 1467, when his consort retired to a convent and died there two years afterwards.

⁵ Arzila was taken in 1471. I take "despois" in the sense of "atras," before, previous to. The year referred to would therefore be 1465.

⁶ Fructuoso ('As sandades') speaks of a Chaplain, a Fleming, of the Infanta and the Infante (D. Ferdinand) at whose instance Fayal was granted to Jost d'Utre, a gentleman of the Infante's household.

⁷ This is borne out by Flemish documents (see p. 48).

¹ March 30 to May 18.

² I have done the best to render the sense of this sentence.

³ There is no word in English for Geschwister. In 1494 there lived at Nürnberg two brothers (Stephen and Michael) and three sisters (Ursula, who had married U. Futterer, Elisabeth and Magdalen, who were in convents) of Martin Behaim. One brother, Wolf, resided at Lyon (1491-98).

⁴ Laetare Jerusalem, "Rejoice ye with Jerusalem" (Isaiah lxvi. 10), the first words of an Introit.

⁵ To the Lord Martin Behaim, the German Knight, in Lisbon, Kingdom of Portugal, son-in-law of the Captain of the islands Fayal and Pico, of the Azores, and of the island of the Flemings, wherever he be.

⁶ Hieronymus Monestarius or Mintzer only arrived at Lisbon at the end of November, 1494, and already left again on December 2.

lugar delrey dom Affonso quinto par apoucar a dita yha do aFayal¹ e foy la e esteua hum anno pello qual acabom de comer ho que tinha pello qual os moradores denojados que nom acharom o que lhes foy prometido andaron para mator o seu capitam² pello qual com boa industria se sayo e foy a portugal onde elrey em vindo sua diligencia e parigos deulhe huma moça fremosa do casa do ynfante dom fernando pay delrey dom manuel chamada para nome ysabel³ de macedo com o qual entam elrey mandou seos navigos e homens honrrados. E o capitam era homem discreto e ouve se tam ben com seos moradores que ouverom por bem de ser seos sojeitos onde comecaron a cavar e roçar e lhes levarom gados das yhas sancta Maria san Miguel e terceyra. E asi hum guylemo Bersmacher Framengo que vie e conheci trouxi primeiro ha layvora do pastel e partio para as outras yhas.

with him to Portugal, where King Affonso V. granted said Utre permission to people said island of Fayal.¹ And he went there and remained a year, in the course of which all they had brought was eaten up, upon which the settlers grew discontented, for they had not found what had been promised them, and they were about to kill their captain.² He, however, quickly left the island and went to Portugal, where the King, in consideration of his diligence and risks, gave him as wife a beautiful maiden of the household of the Infante Don Ferdinand, father of King Don Manuel, whose name was Ysabel de Macedo,³ and with her the King sent his ships and men of work. And the captain was a discreet man and managed so well with his settlers that they thought well to acknowledge themselves his subjects, and they begun to dig and to grup up, and cattle were brought from the islands Sancta Maria, St. Miguel and Terceira. And one William Bersmacher, a Fleming whom I saw and knew, introduced there the cultivation of wood.

Lisbon, himself the son of our above fellow-senator, is being kept in prison at Lisbon, because, compelled by necessity, he met violence with violence, as he can clearly prove and show, and killed a man who, without cause, attempted to assassinate him. They therefore most humbly asked us to intercede on their behalf by letter and prayers with your highness.

Wherefore, and in order that they as well as the aforesaid prisoner may know of our intercession, we inform your Majesty that the family of the Behains has resided in our city of Nuremberg during over two hundred years, in much honour and opulence; and that the ancestors of the above prisoner were ever among our most honoured citizens, respected, of influence and reputation, that they constantly served in civil offices and on the Senate, and used a coat of arms as your Highness may see from the enclosed painting.

We likewise know that Martin Behaim, the father of the aforesaid prisoner, after the death of his father, went to the famous kingdom of Portugal, where he settled, and married Johanna de Macedo, the daughter of Captain Jodocus de Hurter, lord of Habruck, who bore him, in the year 89, the said Martin Behaim, now a prisoner, as the relatives of the same proved to us from documents.

Wherefore we feel inclined to intercede with your serene Highness on behalf of the aforesaid honourable family, for setting free the prisoner Martin. Your Highness is no doubt aware in what manner Martin Behaim, the father of the prisoner, was for many years in the service of your Highness and of your most serene predecessors, in the Kingdom of Portugal as well as in other places, and up to his death. We therefore hope the more confidently that your Serene Highness may feel inclined to set free the prisoners; and we pray your most Serene Majesty most earnestly, to deign, in consideration of the reasons given, as also because of the lustre of his family and the innocence of the prisoner, to accede to our supplication, take off his chains and grant him the shelter of your clemency, considering likewise the long and faithful services of his father, and that which would be worthy of your most serene Majesty, would be more pleasing to us. And we shall at all times endeavour to oblige your Majesty.

Nuremberg, June 7, 1518.

XII.

TWO LETTERS OF THE NUREMBERG TOWN COUNCIL TO THE KING OF PORTUGAL.⁴

The First Letter. June 7, 1518.

To the most serene and excellent Lord D. Emanuel, King of Portugal, and of both Algarves, on this side and beyond the sea in Africa, of Guinea and the navigation of Ethiopia, Arabia, Persia, and India, our most gracious Lord.

The Senate of Nuremberg most humbly commends itself to the most Serene and Excellent Prince D. Emanuel, the most worthy King of Portugal.

Most excellent King! We learn from our fellow-senator Michael Behaim, as also from other members and honourable relatives of that family, how Martin Behaim, the legitimate son of the late Martin Behaim of

The Second Letter, May 12, 1520.

To Don Emanuel, King of Portugal.

Most Serene and excellent King! We offer our most ready services, etc., most gracious Prince.

Martin Behaim, the bearer of this letter, is the legitimate son of the late Martin Behaim, Knight (eques auratus), of Lisbon.

Michael Behaim, his uncle, our colleague, and other members of this honourable family, have explained to us that aforesaid Martin Behaim left Lisbon by sea for Germany and came to Nuremberg last year on a visit of friendship to his Family and relations.

As now he proposes to return to Lisbon and intends to reside in the kingdom of the Lusitanians, he and his relations ask us to commend him strongly to your Royal Highness; on which ground we most respectfully point out to your Majesty, that the family of Behaim has lived for over two hundred years in our city of Nuremberg, eminent, honourable and opulent; that the relations and ancestors of said Martin at all times conducted themselves as excellent and pre-eminent citizens; served constantly in a commendable manner in public offices and as Senators; lived on their feudal rents, and, as we know from authentic deeds, possess estates outside the city where they exercise jurisdiction, and which they manage, always using the coat of arms the design of which Your Highness may perceive from the enclosed painting.

It is known, besides, that D. Martin Behaim, after the death of his father, went to Portugal and resided there, and, as asserted by the relations and the writings in their possession, he there married Joanna de Macedo, the daughter of the knight and captain D. Jodocus de Hurter, Lord of Habruck; and she bore him the above Martin.

¹ Behaim speaks of 2,000 colonists, Flemings and Germans; Val. Ferdinand, in the body of his MS., states that persons against whom a sentence of civil death had been pronounced (outlaws) were sent thither at the request of the Duchess of Burgundy. Cordeiro ('Hist. Ins.', 1467) says that Josse van Hurter, having been appointed capitão donatario, went to Flanders, disposed of his estate, and returned thence accompanied by many other noble men, blood relations and common folk whom he took to Fayal.

² Cordeiro ('Historia Insular', VIII., c. 2) mentions a Fleming, Arnequin, as leader of this revolt.

³ Fructuoso likewise speaks of D. Ysabel as the wife of Josse de Hurter, instead of D. Beatriz, but D. Ysabel, her sister, the "thoma Isabl" of Pock, became the wife of Francisco da Silveira (Vandarago or van der Haghe).

⁴ The original letters, in Latin, have been published by Murr, p. 189; Ghillany, p. 119, and L. Cordeiro, 'Boletim Soc. geogr. de Lisboa,' xvi., 1897, pp. 688-691. See pp. 54, 56.

On these grounds we feel the more inclined to recommend to your Royal Excellency this illustrious family in all things which may profit them and their relation Martin. Moreover we do not doubt that Your Highness is aware how said D. Martin Behaim, the father, during many years, rendered services to the Kingdom, both in Portugal and abroad, and died there.

And as it is his wish to serve your Excellency, when an opportunity shall offer, we most obediently pray your Majesty to deign to consider our prayer and what we say of their illustrious lineage. He fully understands how much our letter and his father's services may be of advantage to him.

On our part we shall be permitted to merit your clemency by offering our most willing services.

Nuremberg, May 12, 1520.¹

¹ This is the date given by Murr, Ghillany, and on a copy in the Archive of the Behaim Family. L. Cordeiro's copy was dated Saturday (Sabbato) after the Invention of the Cross, viz., May 5th.

XIII.

ALBRECHT DÜRER AN MICHAEL
BEHAIM.²

Lieber Herr Michael Behaim,
Ich schickt euch daß wappen wieder
bit laß also beiseben es würdt euch
so keiner verbessern dann Ich hab
mit fleiß künstlich gemacht darumb
dies sehen und her stend die werden
euch wol beschaid sagen, soll man
die lenoble (?) auf dem helm über
sich werffen so verderben sie die
pinday.

E. unterthan,
ALBRECHT DÜRER.

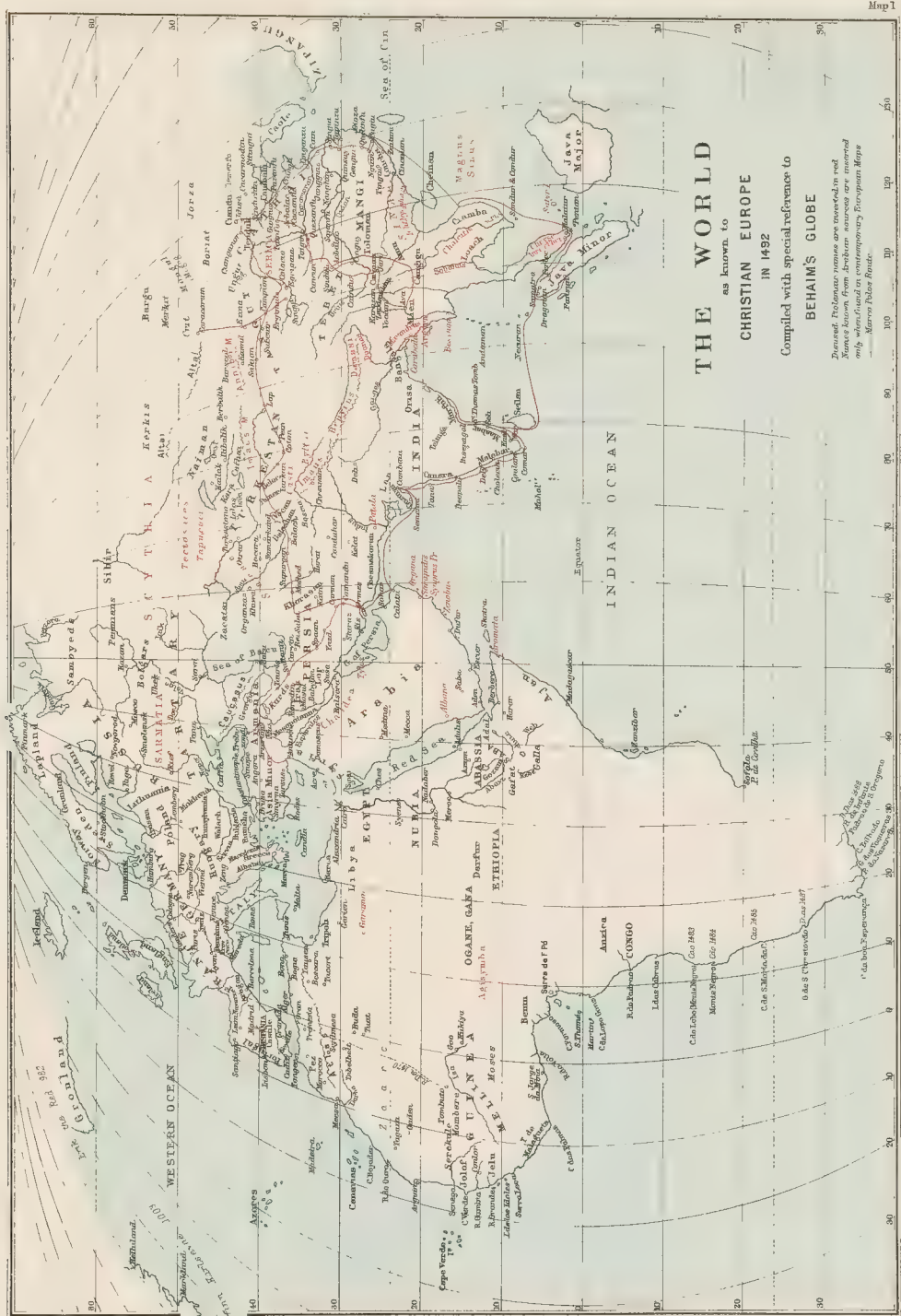
XIII.

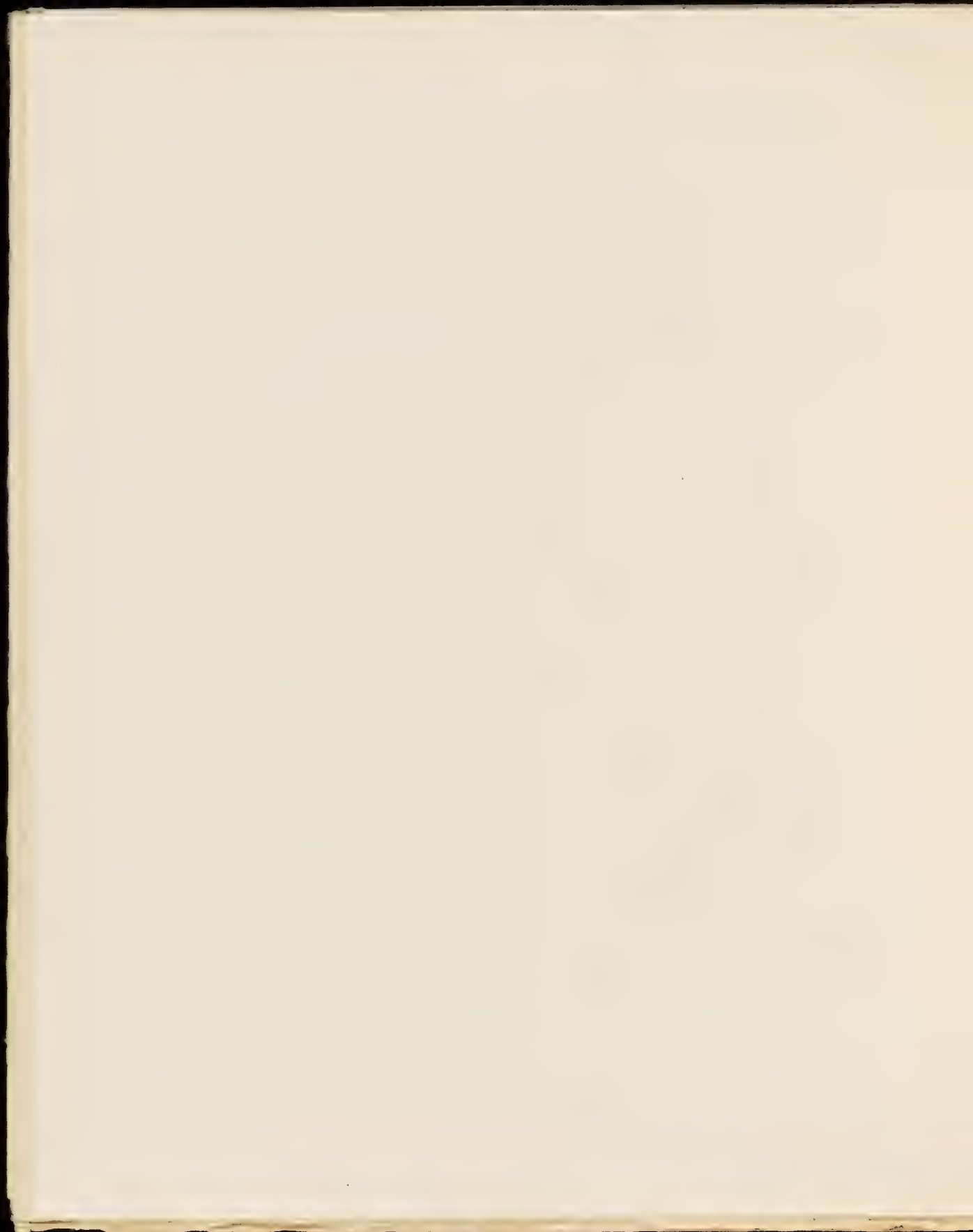
ALBRECHT DÜRER TO MICHAEL
BEHAIM.²

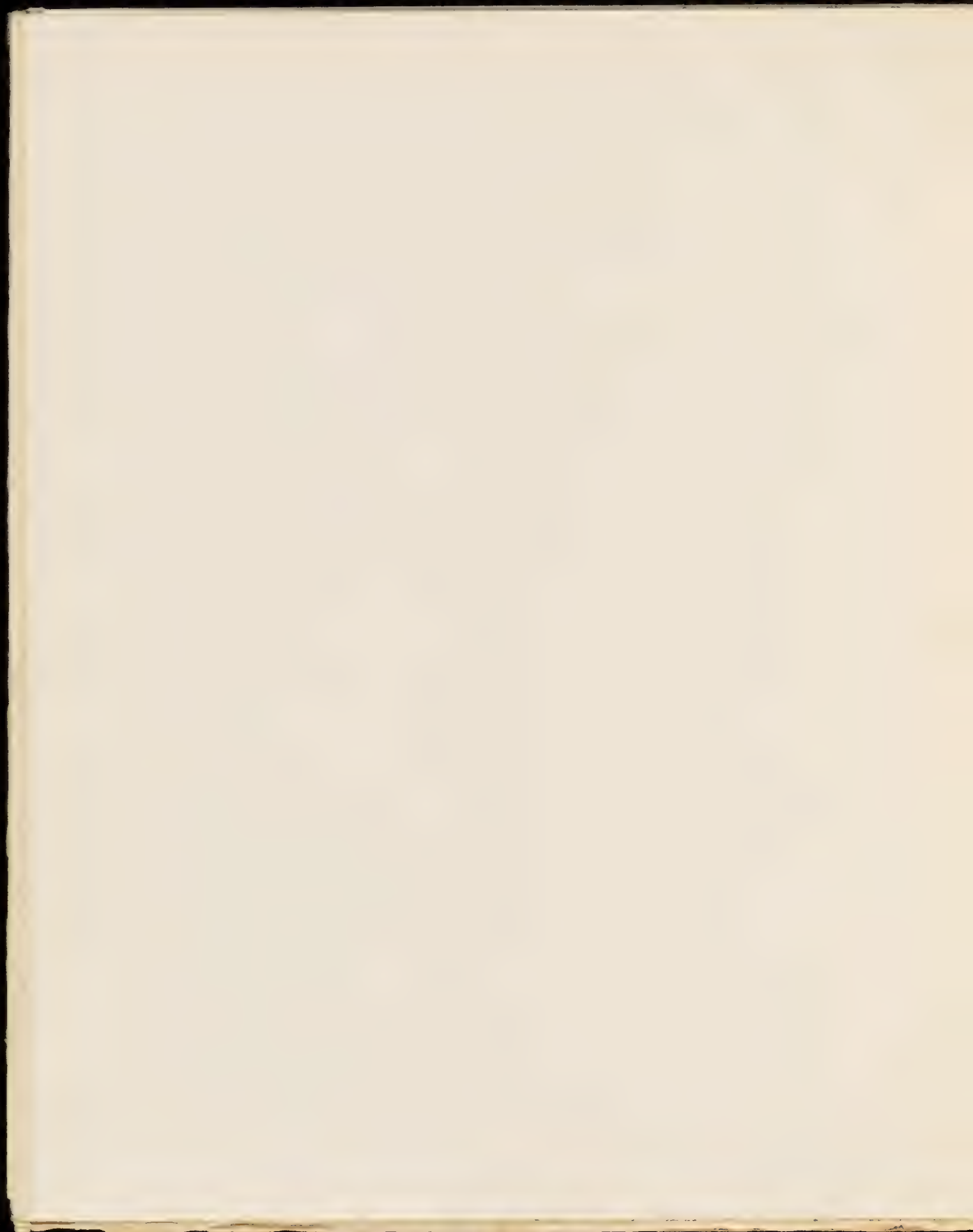
Dear Mr. Michael Behaim,—I
return the coat of arms. Pray let
it be as it is, for no one would
improve it, as I have made it on
purpose artistically, as those who
see and understand it will no doubt
inform you. If the . . . on the
helmet were thrown over it would
spoil the painting.

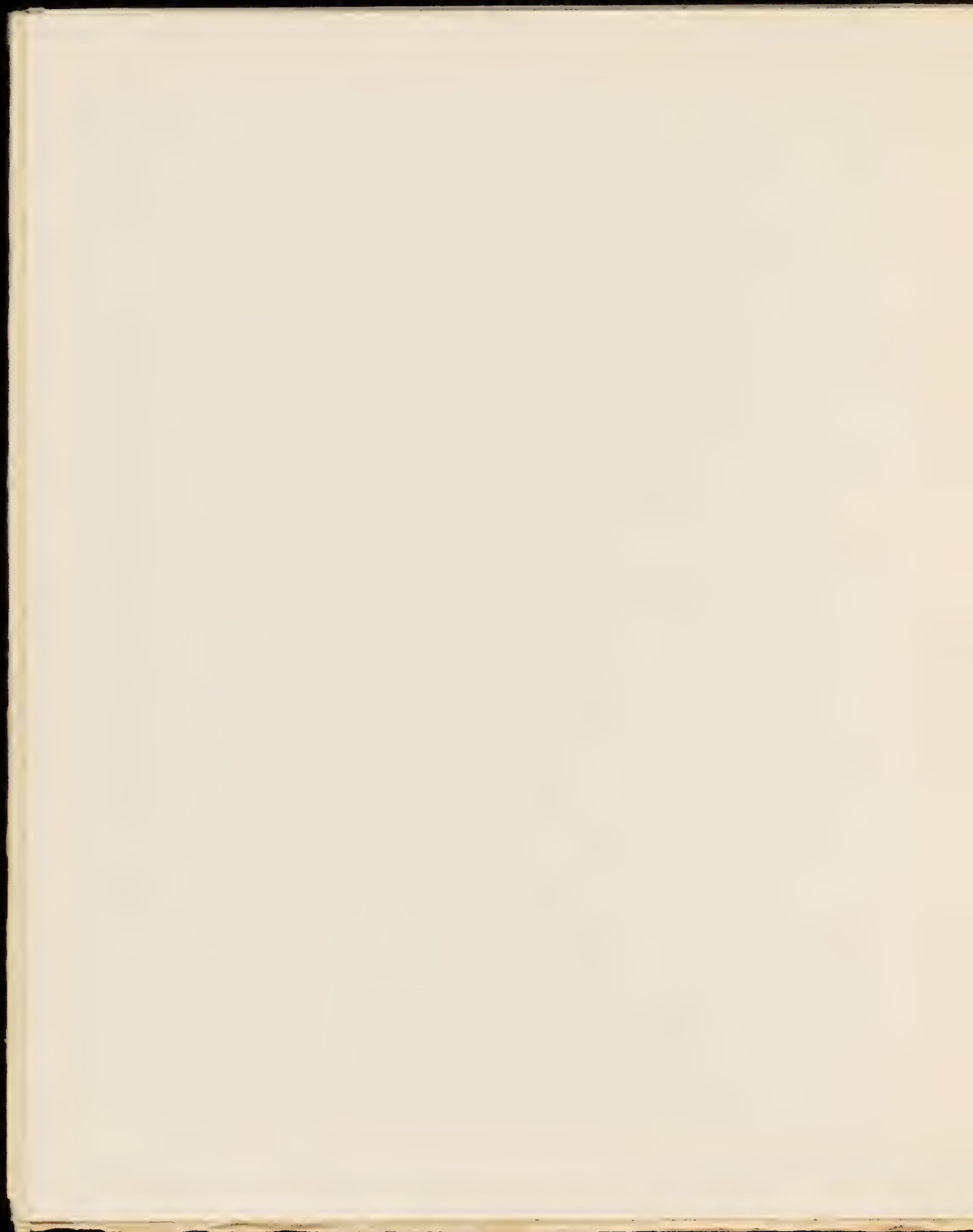
Yours obediently,
ALBRECHT DÜRER

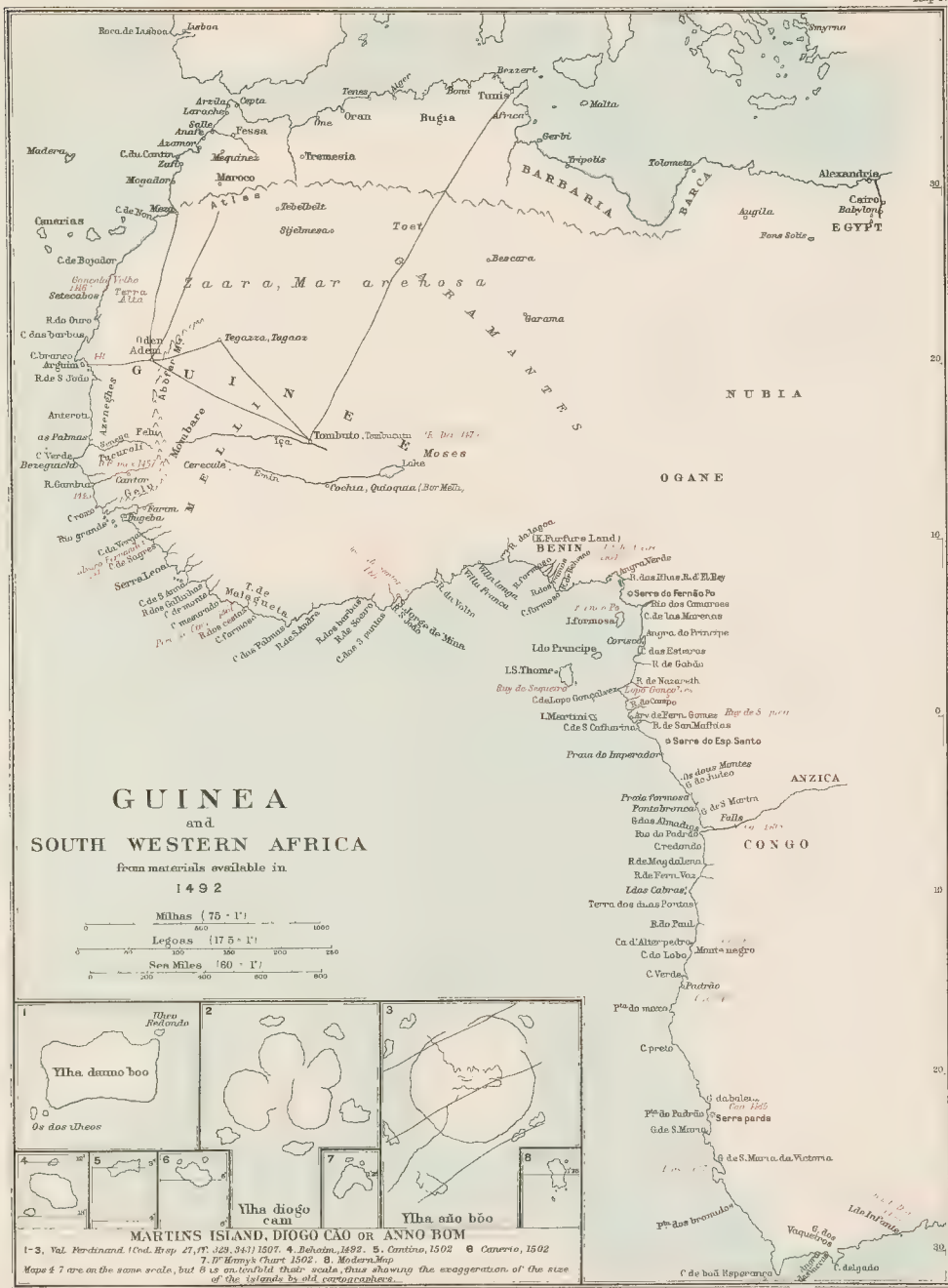
* See p. 55.













INDEX.

ABD AL LATIF, ben Yusuf Mohamed (Arab physician, 13th century), 97.
ABOFAR mountains, 69.
ABULFEDA, Ismael ibn Ali (b. 1273, d. 1331), 15, 101.
ABU OBRID el Bekri (d. 1094), 101.
ABYSSINIA, 102.
ADEN, 29, 102.
AFFONSO, Duke of Bragança, son of John I. (b. 1377, d. 1461), 46.
AFFONSO, son of John II. (1491), 44.
AFFONSO, Diogo (discoverer of Cape Verde Islands, 1461-2), 77.
AGYSIMBA, 97.
AILLY, Pierre d' (Petrus de Alyaco), Cardinal (b. 1350, d. 1420), 13, 32, 35, 73.
ALBANIA, 80.
ALCAÇOVAS, 31.
ALEXANDER THE GREAT (b. 350 B.C., d. 323), 86, 96.
ALEXANDER VI. (Pope, 1492-1503), 44.
ALEXANDRIA, 97.
ALFONSO THE WISE, King of Castile (b. 1226, d. 1284), 19.
ALMEIDA, Diogo d' (governor of D. Jorge, 1490), 44.
ALT, George, (town-clerk of Nuremberg, 1493), 24.
ALVAREZ, Padre Francisco (1520-7 in Abyssinia), 12, 24.
ALVAREZ, Sebastian (factor at Seville, 1512), 34.
ALVACO. See Ailly.
AMAT DI S. FILIPPO, Count Pietro (jointly with G. Uzielli author of "Studi biografici," Rome, 2nd edition 1382).
AMERICA, SOUTH, Sketch of its discovery, 1498-1520 (with 10 Maplets), 35-7.
AMORETTI, CARLO (b. 1741, d. 1816), 2.
ANGAMAN, 88.
ANGLO-SAXON MAP OF THE WORLD (10th century), 99.
ANNONON, discovery, 22, 28, with map, 5.

ANTILIA, 46, 76.
ANTONIO, Prior of Crato (b. 1531, d. 1595), 51.
ANTWERP, 8, 9.
APIANUS (Blenewitz) Peter (b. 1495, d. 1551), 16, 17, 18, 63.
ARABIA, 82.
ARAGÃO, B.C. Teixeira de (1853-92), 21, 33.
ARGUIN, 99.
ARMENIA, 31.
ASIA MINOR, 81.
ASSYRIA, 22.
ASTROLABES, 12, 15.
ATLAS, 92.
AUSTRIA, 79.
AUTHORITIES consulted in making the Globe, 62, 71.
AYEIRO, João Affonso d' (navigator 1481-5), 23, 30, 101.
AYEZAC de Castera Macaya, Marie Amard Pascal d' (b. 1800, d. 1875), 57, 61.
AZAMBUJA, Diogo d' (b. 1482, d. 1512), 16, 21, 100, 105.
AZEVEDO, Alvaro Rodriguez de (1875), 50.
AZEVEDO BASTO, R. E. de, 4.
AZORES, 75.
AZURARA, Gomes Eannes d' (historian, d. 1474), 62, 69, 76, 77, 101.

BAASCH, Dr. E. (librarian Commerzbibl., Hamburg, b. 1821), 74.
BABYLON, 82.
BACK-STAFF, 17.
BADAJOS (Junta de, 1524), 22.
BALBINUS, Boheslav (b. 1612, d. 1628), 3.
BALTIC SEA, 73.
BARCA, 98, 102.
BARGU, 91.
BARROS, João de (historian, b. 1496, d. 1570), 3, 7, 12, 22, 23, 30, 34, 35, 45, 48, 76, 99, 101.

BARTH, Hans (poet, b. 1862), 52.
BARTH, Heinrich (African traveller, b. 1821, d. 1865), 101.
BARTOLOMEO, Fiorentino (in India, 1401-25), 69, 89.
BASTO, Raphael Eduardo de Azevedo (keeper of Torre do tombo, 1908), 4.
BAUDET, P. J. (1879), 46, 48, 114.
BAUER, Karl and Joh. Bernhard, mechanicians, 58, 59.
BEATEIZ. See Brites.
BEATUS, Livenensis (d. 792), 96.
BECKER (Captain, German Navy, 1893), 22.
BEDA VENERABILIS (b. 674, d. 735), 95.
BEHAIM OF SCHWARZBACH, family, with coat of arms, 5.
BEHAIM, Agnes, wife of Martin B. (d. 1487), 6.
BEHAIM, Albrecht (burgomaster, 1332-42), 6.
BEHAIM, Elisabeth (sister of Martin B., 1466-1536), 7.
BEHAIM, Friedrich (grandson of Leonhard, 1491-1533), 7, 54.
BEHAIM, Friedrich (Senior familie, b. 1854), 4, 56.
BEHAIM, Friedrich Carl (Senior familie, 1847), 60.
BEHAIM, Georg Friedrich (Senator, d. 1682), 39.
BEHAIM, Hanns (architect,), 6, 42.
BEHAIM, Leonhard (uncle of Martin, 1432-26), 7.
BEHAIM, Magdalena (sister of Martin, d. 1538), 7.
BEHAIM, Martin (father of the "Navigator," b. 1437 d. 1474), 6.
BEHAIM, Martin (the "Navigator," b. 1459, d. 1507), 6, 41.
BEHAIM, Martin (son of preceding, b. 1489), 53.
BEHAIM, Michael (grandfather of Martin, b. 1406), 6.
BEHAIM, Michael (brother of Martin, b. 1474, d. 1532), 2, 6, 31, 41, 51, 53, 54.
BEHAIM, Michael (son of Leonhard, b. 1459, d. 1511), 7, 41.

BEHAIM, Stephen (brother of Martin, b. 1460, d. 1511), 6, 10, 41, 42, 54.
BEHAIM, Ursula (sister of Martin, b. 1743, d. 1529), 7, 41.
BEHAIM, Wilhelm (b. 1857), 4, 56.
BEHAIM, Wolf or Wolfrath (brother of Martin, b. 1507), 6, 10, 11, 12, 41, 42, 51.
BEHAIM'S river, 24, 100.
BEJA, Duke of, subsequently King Manuel, 30.
BELLINI, Giovanni (painter, b. 1428, d. 1516), 70.
BEMOYN (King of the Jolof, 1428), 66.
BENGA, 84.
BENIN, kingdom, 23, 100.
BENINCASA, Andrea (1476-1508), 68, 75, 81, 97, 98.
BENINCASA, Gracioso (father of Andrea, 1435-82), 77.
BENZONI, Girolamo (historian, 1541-56 in West Indies), 35.
BERGEN-OF-ZOOM, 9.
BERGI, 91.
BEKKER. See Janibog.
BERNALDES, Andres (parish priest), 33.
BESSARION, Cardinal (b. 1395, d. 1472), 16.
BEZOLD, G. von (Director of Germanic Museum, b. 1840), 4.
BIEDERMANN, J. G. (1745), 6, 31, 42, 51.
BIELEFELD, J. F. von (b. 1717, d. 1770), 14.
BIENSWITZ. See Apianus.
BITTNER, Dr. (1867), 16.
Boehr, Dr. A., 26.
BORDE, Andrew (b. 1500, d. 1549), 74.
BORMELLI, 69.
BOVENSCHEN, A. (b. 1864), 65.
BRAANCAMP-FREIRE. See Freire.
BRANDAN, St. (Abbot of Cluenfert, d. 576), 77.
BRANDAN, Island of St., 75, 77.
BRATZL, Matthaues (1488), 70.
BRAZIL, Insula de, 46, 75.
BRESSLER, Md. Henrietta, 62.

BRUSING, A. (d. 1892, director of a naval college), 3, 13, 16, 20.
BRITES (Beatriz), wife of D. Fernando, Duke of Vizeu, 47, 48.
BRITISH ISLES, 74.
BRITO REBELLO, Jacinto Ignaco (1906), 19.
BRITTANY, 79.
BUJA, 98.
BUR-BA-SIN, 24, 99.
BURBURUM, King of Jolof, 24, 99.

CABO LEDO, 24, 27, 103.

CABRAL, Pedro Alvarez (disc. of Brazil, b. 1460, d. 1526), 15, 17, 19, 37.
CADAMOSTO, Luigi (b. 1432, 1456 in West Africa), 68, 69, 76, 99.
CAFFA, 80.
CAIRO, 89, 97.
CALLISTHENES, Pseudo- (c. 400), 96.
CALVETONCE. *See* Chauveton.
CAMDEN, William (antiquary, b. 1551, d. 1623), 75.
CANANNA, Rio de, 37.
CANARIES, 76.
CANDIA, 80.
CANDYN, 88.
CANDRIO, Nicolas de, his map (1502), 29, 36, 39.
CANTINO, Alberto, his map (1502), 26, 27, 29, 36, 103.
CANTO, Ernesto do (Editor of 'Arch. des Açores', 1878-94), 3, 29, 47, 50, 56, 113.
CANTOR, on the Gambia, 69, 101.
CÃO, Diogo (voyages, 1482-86), 20-22.
CAPE CROSS (Padrão of, 1485), 22.
CAPE OF GOOD HOPE, 23.
CAPE VERDE isles, 76.
CARAMANIA, 82, 83.
CARLI, Giovanni Rinaldo (b. 1720, d. 1795), 40.
CARPINI, Giovanni di Pian de. *See* Pian de Carpin.
CARVALHO. *See* Vasconcellos.
CASANOVA, Senhora (artist), 61.
CASAS. *See* Las Casas.
CASTANHEIRA, Fernão Lopez (historian, d. 1559), 12.
CASTILHO, Alexandre Magno de, 103.
CASTILLA, 79.
CATALAN MAP of 1375, 64, 65, 66, 80, 81, 95, 101.
CATALDO de Aquila (tutor to D. Jorge, 1494), 12, 44.
CATHAI, 92.
CAUCASUS, 81.
CAZUTO (Congo ambassador, 1488-90), 22, 66.
CELLARIUS, Christ. (historian, b. 1638, d. 1707), 48.

CELTES (Pickel) Conrad (humanist, b. 1459, d. 1508), 3, 42, 43.
ÇEBEKULE, 69.
CEYLON, 86.
CHAGAS, Frei Diogo das, 114.
CHAGAS, Manuel Pinheiro (historian, 1852), 3.
CHARLES THE BOLD of Burgundy (b. 1433, d. 1477), 8, 43.
CHAUVEYTON, Urbain (of Geneva, 1565), 35.
CHRIST, ORDER OF, 31.
CIAMBA, 85.
CINNAMON, 26, 72, 87.
CINTRA, Pedro de (1462), 63, 99.
CIPANGU (Japan), 34, 89.
CLADERA, Christóbal (1791), 3, 40.
CLAVUS Swartho, Claudius (1423), 69.
CLEMENFU, 90, 92.
COCHIA (Kukiya), 69.
CODINE, J. (b. 1817, d. 1894), 22, 23, 30, 60, 85, 103.
COELHO, Gonzalo (1503 to India), 37.
COIGNET, Michel (of Antwerp, 1581), 16.
COLUMBUS, Bartholomew (b. 1461, d. 1514), 13, 32, 33, 36.
COLUMBUS, Christopher (b. 1451, d. 1506), 12, 13, 17, 32, 35, 57, 77.
COLUMBUS, Ferdinand (b. 1488, d. 1539), 33.
COMMANUS, Manuel (b. 1443, d. 1487), 96.
CONDER, C. R. (b. 1848), 94.
CONGO, river, 21, 103.
CONGO, kingdom, 22.
CONSTANTINOPLE, 80.
CONTRI, Nicolo de' (travelled in East, 1415-40), 88, 94.
CONTRACTUS, Hermann (d. 1054), 15.
COOLEY, William Desborough (d. 1883), 65.
COOTE, C. H. (b. 1839, d. 1899), 36.
CORDEIRO, Antonio, S.J. (b. 1641, d. 1722), 12, 39, 48.
CORDEIRO, Luciano (b. 1844, d. 1900), 16, 21, 50.
CORDIER, Prof. Henri (b. 1849), 63, 92.
CORFU, 30.
CORRAMBEET, E., 61.
CORREA, Diogo Fernandez (factor at Antwerp, 1492), 44, 45.
CORREA, Gaspar (historian, d. 1570), 19, 23, 35, 38.
CORTEREAL, João Vaz (d. 1497), 47.
CORTEREAL, Manuel d'Utra (grandson of Joz d'Utra I.), 50.
CORTEZ, Martin (son of the conqueror of Mexico), 16.
CORA, Juan de la (pilot of Columbus, killed 1509), 13, 27, 35, 36, 68, 103.

COUTO, Diogo de (historian, b. 1542, d. 1616), 53.
COVILHÃ, Pero de (1486 to Abyssinia), 12, 24.
CRATES of Mallos (d. 145 B.C.), 65.
CRESQUES, Hasdai (author of Catalan Map, 1375), 66.
CRIMMAN TARTARS, 80.
CROPP, Dr. A. C. (1848), 60.
CROSS-STAFF, 13, 16.
CUNHA, Tristão da (d. about 1550), 19, 37.
CUNNINGHAM, General Alex., R.E. (b. 1817, d. 1893), 85.
CYLINDER (Sundial), 17.
CYPRUS, 81.

DAENHARDT, H. (German Consul at Lisbon), 4, 11.

DAPPER, Olfert (physician and geographer, d. 1670), 12, 26.
DARIUS (defeated by Alexander, 331 B.C.), 90.
DAUPHINE, 79.
DAVIS, John (navigator, b. 1549, d. 1605), 17.
DE GOEJE, M. J. (1890), 77.
DEI, Benedetto (b. 1418, d. 1492, visited Timbuktu), 101, map 5.
DELY, 85.
DENMARK, 77.
DENNETT, R. E. (African merchant), 26.
DESPLAGNE, Lieut., 69.
DIAS, Bartholomew (Disc. of Cape), 1487-8, 33, 66.
DOG-FACES, 23.
DONATO, Francesco (Duke of Venice, 1545-53), 64.
DOPPELMAYER, J. C. (b. 1671, d. 1759), 3, 30, 40, 60, 61, 98, 104.
DOPPERE, Remboudt de (1496), 45.
DORIA, Teodosio, and the brothers Vivaldi (1291), 25.
DORFF, Jorius van (clothier of Mechlin, 1476), 8.
DRUMMOND, Francisco Ferreira, of Terceira (1800), 7.
DULCET, Angelino, of Mallorca (1339), 36, 75, 77, 101.
DULMO, Fernão, of Terceira (1486), 29, 41, 47, 50, 77.
DÜRER, Albrecht (b. 1471, d. 1528), 2, 5.
DURO, Cesare Fernandez (Captain Spanish Navy, d. 1908), 21.
DUTRA. *See* Hurter.

EDRISI, Abu Abdallah Muhamed ben Muhamed (b. 1099, d. 1180), 101.

EDWARD IV. of England (b. 1442, d. 1483), 43, 45.
EGYPT, 97.
ELMINA, 100.
ENCISA, Martin Fernandez de (in West Indies, 1510), 19, 37, 88.
ENGLAND, 75.
ENGLISH BROTHERHOOD at Lisbon, 11.
ENGLISH SEA, 73.
EPHEMERIDES, 18.
ERATOSTHENES (b. 273 B.C., d. 194), 66.
ERRARA, Prof. Carlo (1904), 41.
ESPADA, Marcos Jimenez de la (1877), 46.
ESTREITO, João Afonso do, of Madeira (1486), 29, 41, 47, 50.
ETZLAUB, Erhard (b. 1460, d. 1538), 59.
EUGEN IV. (Pope, 1436-47), 89.
EYB, Bartholomew von, 6, 7, 8.

FALEIRO, Ruy (astronomer, d. 1529), 14.

FAYAL and the Azores, 46, 75.
FERDINAND, Valentin (printer), 2, 10, 28, 37, 48, 68, 76, 100, 114.
FERGHANI (d. 830), 13.
FERNANDEZ, João (1445-7), 59.
FERNANDO, Duke of Vizeu (son of Duarte V., b. 1433, d. 1470), 32, 46, 76.
FERNANDO (son of King Manuel, 1528), 68.
FERREER, John (1346), 99.
FEZ, 98.
FICALHO, Conde de (1874-84), 25.
FILASTRE, Cardinal Guillaume (1413), 95.
FIORINI, Matteo (b. 1827, d. 1901), 57, 58.
FISCHER, Jos., S.J. (b. 1858), 28, 36, 70.
FLEMINGS on the Guinea Coast, 25.
FLEMISH SETTLERS in Fayal, 47.
FONSECA, Juan Rodriguez de (1518), 34.
FORSTER, Helene von (1907), 53.
FOSSÉ, Eustache de la (1483), 21.
FOURNIER, George, S.J. (b. 1595, d. 1652), 16, 17.
FRANCE, 79.
FRANKFURT fairs, 8.
FREDERICK III., German Emperor (b. 1415, d. 1493), 18, 45, 69.
FREIRE, Anselmo Braancamp (archaeologist, 1901), 31, 47, 49.

- FROBENIUS, L. (1907), 22.
FRUCTUOSO, Dr. Gaspar, S.J. (d. 1591), 3, 41, 50.
FUGGERS of Augsburg, 14.
FUR TRADE, 91, 92.
FÜRER, Joh. Sigismund (1759), 40.
FURFUR'S LAND, 24, 28, 72, 100.
- GADES, 79.
GAIRDNER, J. (historian, b. 1828), 43.
GALLOIS, Prof. Lucien (b. at Metz, 1857), 2, 4, 28, 29.
GALLS, 10.
GALVÃO, Antonio (b. 1503, d. 1551), 21, 23, 32, 68, 77.
GAMA, Estevão da (1502), 37.
GAMBIA, 99.
GAMO, Vasco da (b. 1469, d. 1524), 12, 15, 19.
GANGES, 94.
GARAMA, 97.
GARGILASSO de la Vega, Ant. (b. 1520, d. 1616), 39.
GASTALDO, Jacobo (1546-61), 65.
GATO in Benin, 23, 30.
GATTFER, Joh. Christ. (b. 1727, d. 1799), 1.
GEBAUER, Prof. J. Chr. (b. 1690, d. 1733), 40.
GELCIOI, Eugen (b. 1854), 3, 19.
GENOESSE MAP of the world, 1457, 64, 66, 88.
GENOESSE on the Guinea Coast, 25.
GERBILLOX, J. F. (b. 1634, d. 1707), 95.
GERMAN BROTHERHOODS in Lisbon, 10, 11.
GERMANY, 78.
GERSON, Levi ben, of Bañolas (1342), 16.
GHANA, 101.
GHILLANY, F. W. (b. 1807, d. 1876), 4, 6, 31, 39, 41, 42, 45, 50, 51, 53, 59, 61.
GIRON, river, 94.
GLOCKENGIESER, 58.
GLOCKENTHON, George (d. 1517), 59.
GOBI, 91.
GOES, Damião de (historian, b. 1501, d. 1573), 31, 45, 54.
GOLD COAST, 100.
GOLD ISLANDS, 89.
GOLDEN HORDE, 80.
GOLOF, 99.
GOMARA, Francisco Lopez de (historian, b. 1510, d. 1560), 35.
GOMEZ, Diogo (b. 1420, d. 1485), 17, 32, 68, 69, 74, 76, 99, 101.
GOMEZ, Fernão (Guinea trader, 1469-74), 21, 102.
GONÇALVES, Lopo (1472), 21, 102.
- COUGH, Richard (antiquary, b. 1735, d. 1809), 75.
GRANADA, 79.
GRANPRÉ, Gigot de (1890), 61.
GRANBY, Francis L. (Lyon Clerk), 74.
GRAUERT, Dr. H. (b. 1850), 1, 69, 112, 113.
GREECE, 80.
GREENLAND, 78.
GREGORY, Bishop of Nissa (b. 331, d. 394), 74.
GRIFF, B. (1864), 10.
GRIFFONI, U. (1902), 41.
GRIGGS, W., 62.
GROLAND, Nikolaus (1492), 59, 71.
GROOTE, Dr. Eberhard von (b. 1789, d. 1864), 70.
GRYNARUS, Simon (b. 1493, d. 1541), 63.
GUERNATIS, Angelo de (b. 1840), 2.
GUILLEMARD, F. F. H. (b. 1852), 34.
GUINEA, 101.
GUINEA ISLANDS, 24, 25, 28, 101.
GUINEA pepper, 23, 25, 26.
GUMMÉ, Alfred (1897), 88.
GÜNTHER, Dr. Siegmund (b. 1848), 4, 8, 9, 14, 16, 20, 31, 41, 42, 43, 48, 51, 52, 55, 58, 62.
GUTHRIE, William (b. 1708, d. 1770), 48.
GUTSCHMID, Alfred von (b. 1835), 94.
- HÄBLER, Dr. Konrad (b. 1857), 38.
HABRUCK, 115, a corruption of Haegbroeck in Flanders, 48.
HAGEN, F. C. (1710), 39, 40.
HAGEN, F. C. (1889), 8.
HAGHE, Willem van der. See Silveira.
HAITHON of Armenia (1307), 95, 96.
HAMMER-PURGSTALL, Joseph (b. 1774, d. 1856), 80.
HANY, E. T. J. (b. 1842), 29, 46, 75, 88.
HARDMAN (1675), 75.
HARDING'S CHRONICLE, 74.
HARFF, Arnold von (Pilgrimage, 1496-99), 70, 104.
HARO, Christobal de (Merchant Prince), 38.
HARRISSE, Harry (b. 1830), 3, 33, 34, 36, 37, 40, 46, 47, 101.
HARTMANN, Bernhard (1889), 2.
HAUTBER, E. D. (b. 1695, d. 1715), 40.
- HAVILAH, 74.
HAVRE DE GRACE, 79.
HEBERLEIN, Fritz (clothier, 1478), 9.
HEERWAGER (1860), 7.
HEIDELOFF, C. (drawings-master, 1842), 4, 62.
HENRY THE NAVIGATOR (b. 1394, d. 1460), 45, 74, 76.
HENRY VII., Tudor (b. 1456, d. 1509), 43.
HENSCHELL, G. A. L., 32.
HERCULES, Columns of, 24, 25, 71, 74.
HEREFORD MAP (1280), 77.
HERRERA, Antonio de (historian, b. 1599, d. 1635), 14, 19, 32, 33, 113.
HERWART, Anton, of Augsburg (knighted 1494), 31.
HIGDEN, Ranulfo (d. 1363), 73.
HIRSCH, J. D., of Hamburg, 11.
HIRSCHVOGEL, Leonard (uncle of M. Behaim), 9, 10, 18, 42.
HIRSCHVOGEL, Veit (painter, 1461-1525), 5.
HISPANIA, 79.
HOJEDA, Alonzo de (1470-1515), 35.
HOLSTEIN, Marquez de Sousa (1877), 14.
HOLZSCHUHER, George (d. 1526), 1, 42, 58, 71.
HOLZSCHUHER, Jacob (d. 1504 at Lisbon), 10.
HOLZSCHUHER, Peter (d. 1504 on a voyage to India), 10.
HOLZSCHUHER, Wolfgang (knighted 1503), 10, 31.
HOMER, Alvano Martin (1474), 47.
HORIZON of the Globe, 73.
HORMAYR, Joseph von (b. 1782, d. 1848), 69.
HOWORTH, Sir Henry S. (b. 1842), 80.
HUMBOLDT, A. von (1709-1859), 3, 4, 14, 16, 51.
HÜMMERICH, Franz (1898), 37.
HUNGARY, 78.
HURTER (Utra), family and coat of arms, 48.
HURTER, Baldwin, 48.
HURTER, Diogo (son of Baldwin), 48.
HURTER, Josse (Jodocus, Jobst), known in Portugal as Joz d'Utra (d. 1495), 11, 48, 49, 76.
HURTER, Josse (Joz d'Utra), his son (d. 1549), 2, 49.
HURTER, Joanna, wife of Martin Behaim, 49.
HURTER, Isabel (Pock's Thona Isabel, mar. Fr. der Silveira), 43, 48.
- IBN BATUTA (d. 1377), 101.
IBN SAID (b. 1214, d. 1274), 101.
ICELAND, 74.
IMHOF, Liout. Hans von (1904), 1.
IMHOF, Hans (at a Jew's wedding, 1485), 9.
IMHOF (Incurio), Paulus (d. 1507), 51.
INDIA, 83-85.
INDIAN OCEAN, 74, 86.
INDIAN SPICE-TRADE, 87.
IRELAND, 75.
IRON GATES, 96.
ISABELLA OF BURGUNDY, daughter John I., 47, 48, 76.
ISIDOR of Seville (b. 560, d. 625), 62, 86, 89.
ISIDOR MERCATOR (Pseudo-Isidor, 850), 94.
ITALY, 79.
IVAN III. of Muscovy (b. 1440, d. 1505), 78, 80, 113.
IWAK, Khan of the Sherban horde (480), 80.
- JACOB (Jacom) of Brügge (1450), 47.
JACOMO de Majorca and the School of Sagres, 14.
JAMBEG KHAN (1342-57), 80.
JAVA, MAJOR and MINOR, 87.
JEROME, St. (b. 340, d. 420), 21, 95, 96.
JEWS, deported to S. Thomé (1492), 28.
JIMINEZ. See Espada.
JINGHIZ KHAN (b. 1154, d. 1226), 91, 92.
JOANNA, sister of John II. (b. 1454, d. 1490), 47.
JOANNA OF CASTILE (bride of Alfonso V., b. 1462), 12.
JOÃO of Elvas, 45.
JOHANNES PRESBYTER. See Prester John.
JOHN. See Giovanni.
JOHN (Cabra's pilot), 15.
JOHN I. of Portugal, 47.
JOHN II. of Portugal (b. 1455, d. 1495), 12, 21, 28, 30.
JOHN OF HILDESHEIM (d. 1375), 95.
JOLOF, 99.
JOMARD, E. F. (b. 1777, d. 1862), 36, 60, 61.
JORDANUS (Jourdain), Prior of Séverac (Bishop of Columbum, 1302-30), 85.
JONGE, son of John II. (b. 1481, mar. Beatriz de Bohemia, 1500), 49.
JUBINAL, A. (1836), 77.

KAFFA, 80.
KALBERGER, 58.
KAMBALU, 92.
KAMUL, 91.
KARAKORUM, 91.
KARAMBIN, N. M. (historian, b. 1765, d. 1826), 80.
KERVYN DE LETTENHOVE, Jos. Maria Bruno Const. (historian, b. 1817), 8.
KORBERGER, A. (printer, 1470-1513), 5.
KRETSCHMER, Konrad (b. 1864), 36, 74, 77.
KRUMBACHER, Prof. Karl, 96.
KUBLAI KHAN, 92.
KUCHUK MOHAMED KHAN of Kipchak (1480), 80.
KUNSTMANN, Friedrich (b. 1811, d. 1867), 1, 2, 5, 10.

LACHNER, Ernest (composer, b. 1804, d. 1858), 52.
LA FOSSE, Eustache de (1485), 21.
LAGOS, 100.
LAMPRECHT der Pfaff (author of Alexanderlied, 12th c.), 96.
LAON GLOBE, 57.
LAPLAND, 78.
LA SALLE, Antoine de (b. 1398, d. 1461), 85.
LAS CASAS, Bartolome de (b. 1474, d. 1526), 33, 34, 35, 39, 57.
LAUBMANN, G. von (Director R. Library, Munich, b. 1843), 3, 4, 29.
LAURENTIAN PORTOLANO (1351), 46.
LEAGUE (legos), length, 26.
LEARDO, Giovanni (1448), 60, 86, 104.
LEGHAY, Urbain (1874), 8.
LEIGH, Dr. Edw. (b. 1482, d. 1544), 58.
LEWEL, Joachim (b. 1786, d. 1864), 2, 62.
LEMOIS, Gaspar de (1510), 37.
LENIX GLOBE, 36.
LEO AFRICANUS, 98.
LEONOR (mother of Maximilian), 45, 46.
LEPE, Diego de (1499), 37.
LEWIS, Rev. Thomas, 22.
LIANOR, consort of John II., 44.
LIBYA, 96.
LINSCHOTEN, Jan Huyghen van (b. 1565, d. 1611), 49.
LIPSIUS, R. A. (b. 1830, d. 1861), 94.
LISBOA, João de (pilot, d. 1526), 19, 38.

LOCHNER, Catharina (wife of Michael Behaim), 6.
LOCHNER, G. W. K. (b. 1798, d. 1822), 5, 41, 42.
LOCHNER, Dr. Michael Friedr. (physician, 1712), 40.
LÖHRER, Dr. J. E. von (b. 1812, d. 1892), 40.
LOPEZ, Fernão (b. 1380, d. 1449), 56.
LOPEZ, Thomé (1582 to India), 37.
LORENZETTI, A., of Siena (1290-1348), 70.
LÖWENBERG, J. (d. 1853), 4.
LUTHER, Dr. Martin (1423-1546), 11.

MAABAR, 80, 105.
MACEDO, Brites, wife of Joz d'Utra, 43.
MACEDO, Isabella, wife of Francisco da Silveira, 48, 53.
MACEDO, Joanna, wife of Martin Behaim, 11, 50.
MACEDONIA, 80.
MACOC (Mawo), 80.
MADAGASCAR, 105.
MAFFEI, Giov. Pied. (b. 1536, d. 1603), 12.
MAGELLAN, Fernão de (b. 1420, killed 1521), 19, 34, 37.
MAGNETIC ISLAND, 88.
MAGOG, 96.
MAJOR, Richard Henry (b. 1812, d. 1891), 36.
MALAGUETA, 25, 97.
MALTA, 80.
MANDEVILLE, John (d. 1375), 33, 65, 71, 88, 94, 96.
MANGI, 92.
MANGU KHAN (1251-59), 96.
MANNA, 97.
MANSO, Paiva (1872), 12, 31.
MANUEL, King of Portugal (1469-1522), 44, 46.
MANUEL, D. Nuño (1514), 38.
MANUEL Y VASCONCELOS, Dr. A. (b. 1583, d. 1641), 23.
MARCEL, G. A. (Bibl. Nat., b. 1843), 4, 29.
MARCELLINUS, Ammianus (b. 330), 96.
MARGARITA OF YORK, sister of Edward VI., widow of Charles of Burgundy, 1477, 43.
MARIGNOLA, Giovanni de (b. 1280, on a mission to China, 1338-53), 95.
MARIN, C. A. (1798), 29.
MARINUS of Tyre, 65.
MARSDEN, William (b. 1754, d. 1830), 87.

MARTELLUS Germanus, Henricus (Map, 1489), 22, 64, 67, 102, 103.
MATTHEW, St., 102.
MARTINI, insula, 28, 30, 40.
MARTINS, J. O. de Oliveira (1893), 14.
MARTYR d'Anghiera, Pedro (1459-1525), 33.
MASCARENHA, Fernão Martins de (1484), 30, 31.
MASCARENHA, Pedro de (1511 to India), 37.
MATAL (Metellus), Joan (1520-92), 39.
MATEO of Bergamo (1502), 37.
MATTHAEUS, Petrus (1590), 12.
MAURO, Fra (d. 1459), 64, 65, 66, 74, 85, 92, 97, 99, 101.
MAURY, Mytton (1872), 41.
MAXIMILIAN, King of the Romans (d. 1519), 8, 40, 42, 45.
MAYER, Hans (1505 to India), 10.
MAZIN, 94.
MICHLIN, 8.
MEDINA, Pietro de (b. 1510, d. 1523), 19.
Mees, Dr. Jules (1907), 4, 14, 45, 46, 48.
MELA, Pomponius (43), 39, 70.
MELLI, 69, 99, 101.
MELLO (of Olivença) Cristovão (1485), 30, 31.
MELLO, Fernão de (1499), 28, 31.
MELLO, Gomes Soares (1484), 11.
MELLO, Manuel, 31.
MELLO, Martin Affonso, 31.
MELLO, Rodrigo, 31.
MEN AND WOMEN, islands of, 105.
MENDICANT FRIAR (1356), 46, 76, 99.
MENDO TRIGOZO, Seb. Franc. de (1812), 1, 4, 16, 31, 45, 69.
MENDONÇA, Anna (Mistress of John II., 1421), 14.
MENGLI GIRI (Khan of Crimean Tartars, 1469-1518), 80.
MERCATOR, Gerard (b. 1512, d. 1594), 66, 75, 77.
MERIDIAN of the Globe, 72.
MEROE, 97.
MES, B. J. (1907), 9.
MESOPOTAMIA, 22.
METEORSCOPE, 16.
MILES, length, 26.
MILES AURATUS, 32.
MILLER, Prof. Konrad (b. 1844), 62, 78, 81, 89, 96.
MINUTOLI, J. von (b. 1804, d. 1860), 11.
MIRBACH, Count, of Schloss Harff, 4.
MOERKERKEN, 71.
MOERL, J. S. (1759), 40.
MOLDAVIA, 78.
MONETARIUS. See Muntzer.
MONTEBAYO, João Pedro de (1485), 23.
MONTECORVINO, Friar Giov. de (b. 1247, d. 1332), 95.
MONTE NEGRO, 22, 24, 87, 103.

MOON, mountains of the, 97.
MOREA, 80.
MOREL, Louis (b. 1643, d. 1680), 74.
MORI, Prof. Assunto (1904), 26.
MORMELLI, 69.
MOROCCO, 98.
MOSES (Moyse), 12.
MOSES (Mosi), 69, 101.
MOSTO, Andrea da, 34.
MÜLLENHOFF, R. V. (b. 1813, d. 1884), 77.
MÜLLER, Johann (Regiomontanus, d. 1476), 7, 15, 16, 18, 58, 66, 70.
MÜLLER, Jean (1847), 60.
MÜLLNER, Johan (d. 1634), 39, 59.
MUMMENHOF, E. (b. 1848), 4, 18, 40, 42.
MUMMIES, 97.
MÜNSTER, Sebastian (b. 1489, d. 1552), 17, 60, 68.
MÜNTZER (Monetarius), Hieronymus (d. 1508), 2, 11, 14, 26, 34, 42, 44, 48, 49.
MURFILL, 84.
MURR, Christ. G. von (b. 1733, d. 1811), 3, 6, 7, 15, 31, 39, 40, 43, 44, 51, 52, 60, 61, 102.
MUSA BEN ABU BAKR (1311-31), 101.
MUSK, 49, 101.

NACHTIGAL, Gustav (b. 1831, d. 1885), 101.
NATIGAI, idol, 92.
NAVARETTE, M. F. (b. 1765, d. 1844), 17, 19, 22, 33, 34, 35.
NEKURAN, 32.
NEWE ZEITUNG aus Presslig Land, 1415, 38.
NICOLAUS GERMANUS (1466-82), 62, 69, 70.
NIES, Arnold (1507), 52.
NOAH'S ARK, 81.
NOCTURNAL, 17.
NOGART (Novgorod), 78.
NOLLI, Antonio de (1456), 76.
NORDENSKIÖLD, A. E. (b. 1832, d. 1901), 29, 36, 77.
NORONHA, Garcia de (1513), 2.
NORONHA, Henrique (1508), 53.
NORWAY, 77.
NOVA, João da (1501-2), 19.
NUNES, Pedro (b. 1492, d. 1577), 16, 17.
NUREMBERG EGGS, 18, 51.
NÜRNBERGER, Lazarus, 55.
NÜTZEL, Gabriel (1492), 59, 71.

OBERNITZ, Hans von (1501), 5.
ODORICO de Portenone (b. 1286, d. 1331), 65, 88, 96.
O'FLAHERTY, Roderico (b. 1629, d. 1718), 75.
OG, 98.
OGANE, 23, 69, 101.
OHM, Prof. G. S. (b. 1787, d. 1854), 60.
OMERIS, M. S. (b. 1646, d. 1708), 40.
OPHIR, 94.
OPPERT, Prof. G. S. (b. 1836), 95.
ORAN, 98.
ORMUS, 83.
ORTELIUS, Abraham (b. 1526, d. 1598), 39, 49, 77.
ORTIZ DE VILLEGAS, Diego (d. 1519), 12, 33, 63.
ORTOLPH, Margareta, wife of Stephen Behaim, 6.
OTTO OF FREISINGEN (b. 1114, d. 1158), 82.
OURA, Rio do, 99.
OVERSTÄDT (Sobrevilla, 13th c.), 11.
OVIDO Y VALDES, Gonçalo Fernandes (b. 1478, d. 1557), 35.
PACHECO, Martin Vaz (1511 in India), 37.
PACHECO Pereira, Duarte (b. 1450, d. 1533), 2, 17, 23, 25, 28, 30, 37.
PADERIN (1872 in Mongolia), 91.
PAIVA, Afonso de, 12, 24.
PAIVA, João (Captain of S. Thomé, 1485), 28.
PARETO, Bartolomeu (1453), 59, 75.
PATRICK, St. (Arian Christian, b. 372), 75.
PAUL II. (Pope, 1464-71), 69.
PAUTHIER, J. P. (b. 1801, d. 1873), 93.
PEARL FISHERY, 93.
PEARL ISLANDS, 89.
PEDRO, Flemish chaplain, 1464, 48.
PEDRO DE CINTRA (1462), 68, 99.
PEDRO, Duke of Coimbra (b. 1391, d. 1449), 38, 40, 45, 68.
PEGOLOTTI, Francis Balducci (1315-27), 89.
PENCK, Prof. Albrecht (b. 1858), 4.
PENTAM, 87.
PEPPER, 25, 72, 87, 100.
PEREIRA. See Pacheco.
PEREIRA, Gabriel (Biblioteca Nacional), 1, 2, 4, 32, 48.
PEREIRA, João (Captain of St. Thomé, 1490), 28.
PERKIN. See Warbeck.
PERMIANS, 92.
PERSIA, 82.
PERSIAN GULF, 74.

PESCHEL, Oskar (b. 1826, d. 1871), 3, 58, 88, 101.
PETRUS. See Ailly and Martyr.
PETERSON, Rev. —, 22.
Petz, J. (keeper of city archives, Nuremberg), 16, 58, 70.
PEUCHER, Caspar (b. 1525, d. 1602), 77.
PHILIP OF AUSTRIA (b. 1477, d. 1506), 43.
PHILIP THE GOOD, of Burgundy (b. 1396, d. 1467), 47, 48.
PHILLIPS, R. C. (African merchant), 26.
PHILOSTRATUS, Flavius (2nd c.), 95.
PIAN DE CARPINA, Friar Giov. (1245-47 among Golden Horde), 78.
PIGAFETTA, Antonio (b. 1480, d. 1531), 3, 34.
PIMENTEL, Manuel (b. 1650, d. 1719), 15.
PINA, Fernão de (1482 on a mission to England), 45.
PINA, Ruy de (d. 1521), 2, 11, 21-24, 28, 31, 32, 44, 45.
PINZON, Vicente Yanez (1492-1509), 35, 38.
PIPO, Friar Francesco (1320), 63.
PIREZ, Gonçalo (pilot, 1505), 28.
PIRKHEIMER, Willibrand (b. 1470, d. 1530), 5, 70.
PIUS II. (Enea Silvio, Pope, b. 1405, d. 1461), 33, 39, 69, 112.
PIZZIGANI, F. (1367-72), 36, 75, 77, 99.
PLATA, Rio de la, discovery, 38.
PLINY, Cajus Plinius Secundus, (b. 23, d. 79), 70, 83, 85, 86, 89, 99.
Pô, Fernão (1472), 21, 28.
POCK, Jörg, Factor at Lisbon (1495-1520), 2, 6, 11, 51, 53, 54, 56.
POLAND, 78.
POLO, Marco (b. 1250, d. 1324), 63, 71, 81, 89-96, 102, 104, 105.
POMPEY, Emperor, 86.
POPFEL, Nicholas (1486 and 1488 in Russia), 69.
PORTOLANO chart, 65.
PORTUGAL, 79.
POSTEL, Guillaume (b. 1510, d. 1581), 35.
PRESTER JOHN, 95, 96.
PRINCEPE, Ilha do, 28, 100.
PRUSSIA, 78.
PROLEMY, Claudius (150), 16, 62, 66, 71, 76, 81, 83-85, 88-90, 96, 97.
PULZELLE, Ins. 7 delle, 36.
PURNACH, George (b. 1423, d. 1461), 16, 18.
PYTAEAS of Massilia, 77.

QUADRANT, 17.
QUATREMIÈRE, Etienne Maria (b. 1782, d. 1857), 101.
QUINSAY, 93.
QUINTELLA, Ignacio da Costa (1830), 15.

RACKL, Prof. N. Joseph (b. 1848), 4.
RAFFELS, Sir Thomas Stamford (b. 1781, d. 1826), 87.
RAMÉE (Ramus), Pierre de la (b. 1515, d. 1572), 8.
RAVENSTEIN, E. G. (b. 1834), 16, 20, 26, 70, 97.
RED SEA, 74.
REICKE, E., city librarian, Nuremberg (b. 1865), 4.
REINDEL, Albrecht (b. 1784, d. 1854), 60.
REINHARDTSÜTNER, C. von (b. 1847), 1.
RESENDE, Garcia de (chronicler, b. 1470, d. 1554), 2, 11, 12, 23, 31, 32, 44, 45.
RIBERO, Diego (1519-55), 37, 38.
RICCIOLI, Joh. Bapt. (b. 1598, d. 1671), 39.
ROHLFS, G. (b. 1832), 101.
RUDIMENTUM NOVIORUM, 1475, 94.
RUGE, Sophus (b. 1851, d. 1901), 2, 3, 9, 20, 29, 62, 66.
RUSSIA, 78.

SABA, 82, 95, 96, 102.
SACARUM SITUS, 90.
SACROBOSCO (Holiwood), Joannes de (d. 1221), 75.
SANTARM, M. F. de Barros y Sousa, viscontede (b. 1790, d. 1856), 66, 95.
SARA, 80.
SARAIVA, D. Francisco de S. Luiz (1841), 3, 44.
SAUVENARD, P. (1908), 62.
SCHADEL, Hartmann (b. 1440, d. 1514), 1, 24, 39, 42, 69, 112.
SCHPEFFIG, KARL RICHARD (b. 1848), 4, 13, 41, 59, 60.
SCHMELLER, J. A. (b. 1785, d. 1852), 2, 3, 32, 74.
SCHÖNER, J. (b. 1477, d. 1547), 36, 38, 58, 53, 66.

SCHREYER, Sebald (b. 1466), 6, 24, 42.
SCIAPODES, 104.
SCYTHIA, 90.
SENEGAMBIA, 99.
SIBIR, 80.
SIERRA LEONE, 24, 99.
SILVEIRA (Van der Haghe), 47, 68.
SOCOTRA, 105.
SOLIGO, Christopher, of Venice (1484), 13, 26, 47, 66, 99, 100, 102, 103.
SPAIN, 29.
SPANISH FRIAR (1356), 47, 76.
SPICE TRADE, 89.
STAUBER, Richard (d. 1907), 1, 69, 112.
STEIN, M. Aurel, 91.
STEVENSON, E. L. (b. 1860), 36.
STRABO (b. 66 B.C., d. 4 A.D.), 65, 70, 71, 81, 86, 99.
STÜVEN, J. E. (1714), 40.
SUNDIALS, 17, 18.
SWEDEN, 78.
SWITZERLAND, 79.
SYRENS, 62, 86.
SYRIA, 81.

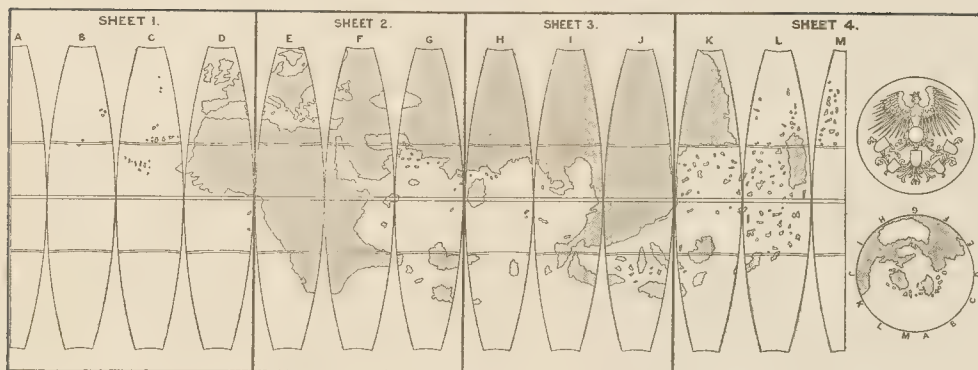
TAMERLAN (Timur Lenk, b. 1333, d. 1405), 91, 96.
TANGUT, 91.
TAPHOBANA, 86.
TARIM, 90.
TARSIS, 95.
TARTARY, 80, 91.
TELLES DA SILVA, Marquis de Alegrete (b. 1709), 12, 16, 23.
TENDUK, 95, 96.
TENERIFFE, 76.
THATCHER, J. B. (b. 1840), 39.
THORNE, Richard (1512), 58.
THORODSON, Thorvals (b. 1855), 74.
THYLE (Thule), 77.
TIBET, 93.
TILFF (Thule), 75.
TIMEUKTU, 101.
TOSCANELLI, Paolo del Pozzo (b. 1397, d. 1482), 33, 57, 64, 66.
TOZEN, Eobald T. (b. 1715, d. 1787), 40.
TRANSYLVANIA, 78.
TRINIDADE, Ilha da (1500), 37.
TRIPOLIS, 92.
TUNIS, 98.
TURKISTAN, 90.

USODIMARE, Antoniotto (1455-56), 76.
UTRA. See Hurter.
UZZELLI, Gustavo (b. 1839, d. 1902), 41, 69, 95.

- V**ALSEQUA, Gabriel de (1439), 46.
VARNHAGEN, Fran. Adolf de (b. 1816, d. 1878), 37.
VASCONCELLOS, Ernesto J. de Carvalho, 1, 4.
VAUS, mount, 95.
VESCONTE, Pietro (1311-18), 99.
VESCONTE de Maiolla (1512), 36.
VESPUCCI, Amerigo (b. 1417, d. 1512), 17, 35, 37.
VICARS, Sir A. E., Ulster King of Arms (b. 1865), 74.
VIGNAUD, Henry (b. 1830), 4, 32, 64.
VILHENA, Beatriz (married D. Jorge, 1500), 31, 45, 47.
VILHENA, Maria (daughter of M. A. de Mello), 47.
VINCENT of Beauvais (b. 1190, d. 1264), 63, 77, 86.
VINCI, Leonardo da (b. 1452, d. 1519), 36.
VITEIRO, Sousa, 12, 34.
VIVIEN de St. Martin, Louis (b. 1802, d. 1897), 62.
VIZEU, D. Diogo, Duke of (1484), 33, 44, 46.
VIZIU, D. Fernando, Duke of, 32, 46, 76.
VIZINHO, José (1485), 12, 13, 19, 23.
VOLKAMER, Paul (1492), 71.
WALDSEEMÜLLER (Hylacomilus, b. 1470, d. 1521), 28, 36, 60, 64, 66, 70, 76, 86, 93, 94, 104.
WALES, 75.
WALSPERGER (1443), 102.
WALTHER, Bernhardt (b. 1430, d. 1504), 5, 8, 12, 70.
VAR (Var), 25.
WARBECK, Perkin (hanged 1499), 43.
WAUVERMANS, General H. E. (b. 1825, d. 1902), 45.
WELSER, of Augsburg, 10, 38.
WERNER, Johann (b. 1468, d. 1524), 5, 42, 59, 70.
WIESER, F. von (b. 1840), 3, 28, 36, 37, 65.
WOLF, Rudolf (b. 1816, d. 1893), 16, 19.
WOLKENHAUER, A., 18.
WRIGHT, Thomas (b. 1810, d. 1877), 75.
WÜLFER, Johann (b. 1651, d. 1724), 40.
WURZELHAU, J. R. (b. 1651, d. 1751), 40.
YULE, Henry (b. 1820, d. 1889), 85, 87, 92, 93, 94.
ZACUTO, Abraham ben Levi, of Salamanca (1492), 12, 19.
ZAITUN, 93.
ZANZIBAR, 104.
ZARA, 98.
ZARNCKE, Edward (b. 1851), 95.
ZIEGLER, A. (b. 1822, d. 1887), 14, 41.
ZURLA, Placido (b. 1759), 59, 64.

WADEN (Oden), 69.
WAGENSEIL, J. Chr. (b. 1633, d. 1705), 3, 39.
WAGNER, Prof. Hermann (1840), 1, 3, 18, 61, 64.
WALACHIA, 78.

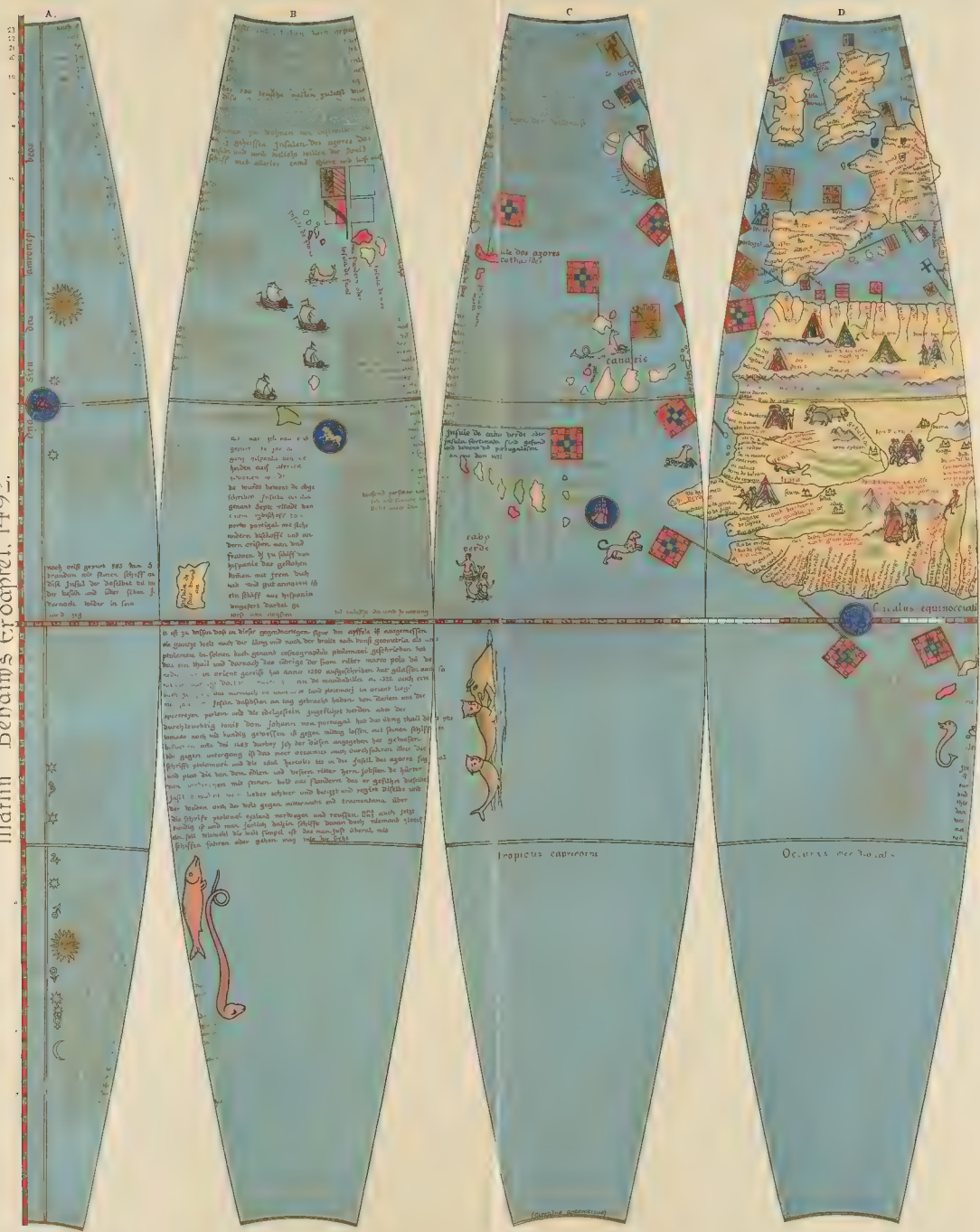
INDEX OF THE FACSIMILE OF BEHAIM'S GLOBE,
SHOWING THE ARRANGEMENT OF THE SHEETS.







Martin Behaim's Erdapfel, 1492.

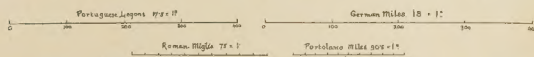








Scale 1 : 25200000



GETTY CENTER LIBRARY



3 3125 00839 8949

